Veterinary Medicine

VOL, XIX JULY, 1924 No. 7

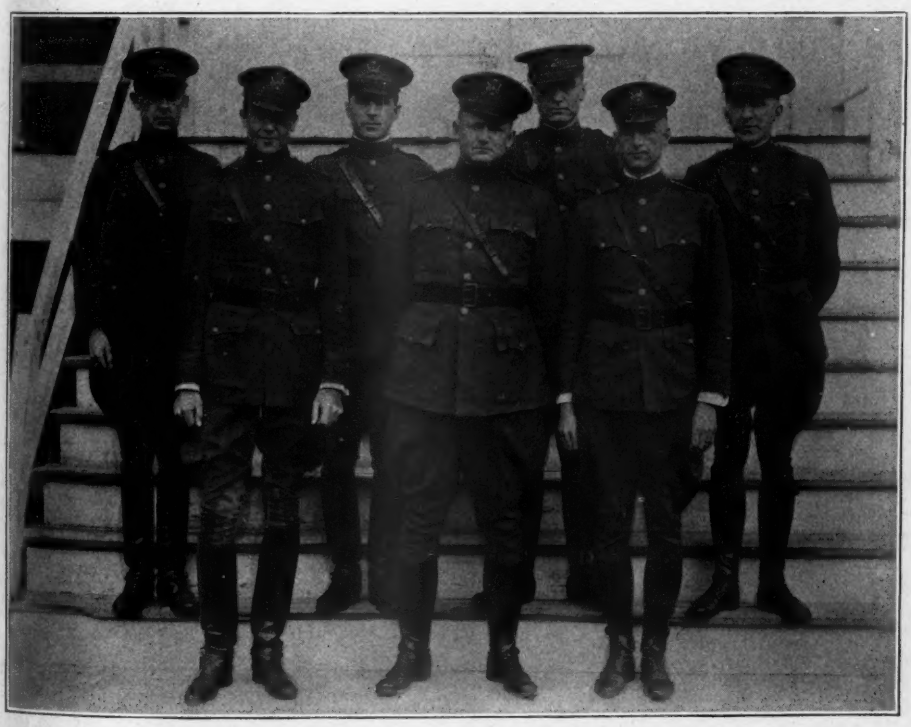
Commencement at the Army Veterinary School

A visit to the Veterinary School at the Army Medical Center at Washington, D. C., is an inspiring and delightful experience to anyone interested in the veterinary profession. This school is the outgrowth of the Army Veterinary School established at Chicago during the war to give veterinarians instruction in the inspection of meat.

In the beginning, the course consisted of but five weeks' instruction and there was only one instructor. The course has been extended to six months and the faculty to ten.

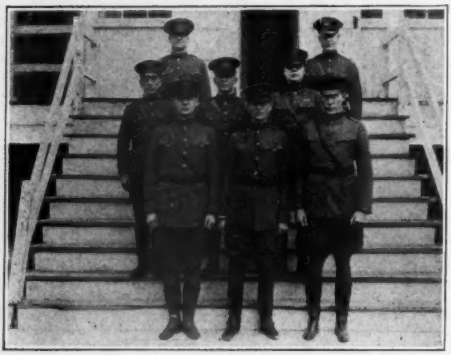
The curriculum now includes: Administration, Animal Sanitation, Meat and Dairy Hygiene, Veterinary Forage Inspection, Preventive Medicine and Clinical Pathology, Sanitary Chemistry and Roentgenology.

The school is located just a few miles from the city of Washington in connection with the Walter Reed Hospital. The laboratories in which the instruction is given are without a doubt the best equipped in the world. The surroundings are ideal for a school of this kind and every facility of the capitol city that can be used for instruction of students at this school is available for them, and splendid advantage is taken of the facilities offered by the Bureau of Animal Industry, the Bureau of



Upper row, reading left to right: 1st Lieut. John K. McConeghy; 1st Lieut. Joseph F. Crosby; 1st Lieut. Frank C. Hershberger; 1st Lieut. John H. Kintner. Bottom row: 1st Lieut. Daniel H. Mallan; 1st Lieut. Maximilian Siereveld, Jr.; Capt. Isaac O. Gladish. Graduating class at the Army Veterinary School, 1924.

Laboratory Grain Inspection. Upper row, reading left to right: 1st Lieut. Frank C. Hershberger; 1st Lieut. Joseph F. Crosby; 1st Lieut. Maximilian Siereveld, Jr.; Capt. Isaac O. Gladish; 1st Lieut. John H. Kintner; 1st Lieut. Daniel H. Mallan; 1st Lieut. John K. McConeghy; Capt. Horace S. Eakins, Instructor.



Upper row, left to right: Capt. George H. Koon; 1st Lieut. Ralph B. Stewart. Middle row: Capt. Daniel W. Fetterolf; Capt. Wm. H. Houston; Capt. Raymond A. Kelser. Bottom row: Capt. Horace S. Eakins; Lieut. Colonel Wm. P. Hill; Major Paul A. Schule.

Markets and the laboratories in connection with the Medical School which are in addition to the veterinary laboratories and located in the same building.

In the past twenty years, possibly more than one hundred articles have appeared in this publication, urging a betterment of the conditions surrounding army veterinary service, but it is doubtful if any writer of those articles expected or even visioned the great advance that this service in the army has made since the war.

It is everywhere apparent in the army that the importance of good veterinary service is recognized and that veterinary officers are now selected and trained to render this service effectively and efficiently.

The following officers graduated at the commencement June 26th: Capt. Isaac O. Gladish; Lt. Joseph F. Crosby; Lt. Frank C. Hershberger; Lt. John H. Kintner; Lt. Daniel N. Mallan; Lt. John K. McConeghy; Lt. Maximilian Siereveld, Jr.

The graduation exercises included an address by the Surgeon General and the presentation of diplomas by the Secretary of War.

Hoskins Memorial Medal, won by Lieut. John H. Kintner. The obverse side of the medal represents Chiron, who in Greek mythology was the great teacher of most of the ancient heroes, including Hercules, Theseus, Aesculapius, Ulysses, Castor, Pollux, Aeneas, Achilles, Meleager and Nestor. Chiron was the founder of the healing art and the wisest of his time. The design shows him holding a cup of medicine and a bandage, conventionally treated. This medal, presented by the officers of the Veterinary Corps, is a fitting testimonial of the work of the late Dr. Hoskins in their behalf.

Bacteriological Laboratory. Studying the Trypanosomas. Reading left to right: 1st Lieut. Joseph F. Crosby; Capt. Isaac O. Gladish; 1st Lieut. Frank C. Hershberger; 1st Lieut. John H. Kintner; 1st Lieut. Daniel H. Mallan; 1st Lieut. Maximilian Siereveld, Jr.; Capt. Raymond A. Kelser, Instructor.

The faculty comprise Lt. Col. Wm. P. Hill, Commandant; Capt. H. S. Eakin, Executive Officer; Capt. R. A. Kelser, Instructor in Veterinary Bacteriology; Capt. Wm. H. Houston, Instructor in Meat Inspection; together with Majors Nichols, Lull, Schule, Hitchens, Fetterolf, Pillsbury, of the Medical Corps, and Hardigg of the Q. M. C.

Hay Inspection, Army Veterinary School

Great credit is due Col. J. A. McKinnon, Director of the Veterinary Corps, and Col. Wm. P. Hill, Commandant of the School, for the excellent course that has been arranged and the superior equipment provided for the school. The gratitude of the whole veterinary profession in and out of the army is due the Surgeon-General for his kindly attitude to the veterinary service that has made its splendid progress possible.

F. & M. EPIZOOTIC ON THE WANE

The foot-and-mouth disease situation in California may be said to be encouraging at this writing. There has been no extension of the disease to uninfected counties during the past month and extensions to new herds have been fewer than in the preceding thirty days.

The work of suppression is being continued without relaxation and all known infected premises have been cleaned and disinfected at this writing. It is believed by the Chief of the Bureau that the authorities have the situation well in hand and the complete eradication of the disease and the lifting of the burdensome quarantines are confidently expected at no distant date.

In the rush of bills at the close of the recent session of Congress, the Deficiency Bill failed to reach a vote and was not passed. However, other funds of the Bureau of Animal Industry have been made available for the purpose of carrying on the work of eradication which will go forward unhindered.

Dr. John R. Mohler, Chief of the Bureau, made a trip to California and the scene of the outbreak during the latter part of June.

IN VETERINARY LITERATURE FIVE YEARS AGO

Veterinary Medicine for July, 1919, contained a notice of the honorable discharge from the army of Major Wm. Reed Blair, Major Albert M. Towner, Major Charles E. Clayton, and Captains H. C. Gale, F. G. Kneup, R. H. Schrecengost, F. D. Bertram, Wm. Brod, W. M. Decker, A. F. Hasselbach, W. C. Pulsifer, A. Moore and I. Myers. The names of twenty-one first lieutenants and forty-seven second lieutenants that received honorable discharges are also given.

Majors H. E. Bemis, L. A. Merillat and Reuben Hilty were promoted to the grade of lieutenant colonel. Captains J. B. Lentz, W C. White, H. B. F. Jervis, R. W. Smith, and W. F. Guard were promoted to the grade of major. Thirty-one first lieutenants were promoted to the grade of captain and twenty-nine second lieutenants were promoted to be first lieutenants, all in the Veterinary Corps.

The number of officers in the Veterinary Corps is stated to be 1126, a decrease of 89 for the month.

Henry Hell, West Liberty, Iowa, tells of gratifying results from the use of an autogenous (for the outbreak) bacterin in the treatment of infectious keratitis in cattle and sheep.

George Berns, Brooklyn, N. Y., tells of removing living fetuses two hours after the death of the bitch from dystocia.

J. C. Flynn, Kansas City, Mo., describes a number of unusual cases in dogs; one of a dog that lived for two years with the pyloric orifice of the stomach closed; another of a case of rabies exhibiting not one of the classical symptoms of this disease; and a third with a completely atrophied pancreas that had an insatiable appetitie.

J. A. Janelle, Sherbrooke, Quebec, recommends the following as a useful prescription for gastritis and intestinal derangements in horses.

Barium chlorid	℥ iv
Strychnin sulphate	gr. ii
Lobelin sulphate	gr. 1/5
Boiled water	0 i

Dose: four to six drams; repeat in 30 minutes.

The same author reports success from the use of digalen in azoturia.

Other articles in this issue that possess as much interest today as they did five years ago are, Dysentery in Adult Cattle by B. L. Lake; Infectious Abortion by G. F. Jungerman; Passive Hyperthermia by W. H. Bailey; Mixed Infection in Swine by W. F. Brownlee; Diagnosis and Treatment of Necrobacillosis in Swine by G. L. Watters; Mixed or Simple Bacterins, Which Shall We Use? by E. B. Carter; Anthrax and Its Control by Wm. L. Gates; and Infectious Diarrhea in Calves by J. F. DeVine.

PRODUCTION OF BIOLOGICS

A report of the Division of Virus-Serum Control, U. S. Bureau of Animal Industry, prepared by Dr. R. E. Holm, Assistant Chief of the Division, March 1, 1924, shows that in 1923 there were ninety-five establishments holding U. S. veterinary licenses. These concerns were distributed throughout sixty cities or towns and twenty-two states. The figures show that the number of these producers has increased materially since 1914, at which time there were seventy-four holding licenses.

The number of veterinary biologic products has also increased, there being only sixty-seven different kinds in 1919, while in 1923 there were ninety classifications, included under the following general classes: aggressins 2, antisera and sera 24, bacterins 39, bacterial filtrates 2, diagnostic agents 3, serobacterins 7, serovaccines 2, vaccines, viruses, toxins 11. The increase occurred principally among antisera, sera and bacterins.

The total yearly production of anti-hog-cholera serum in licensed establishments, 1915 to 1923 inclusive, is shown as follows:

Year	c.c.
1915	208,571,232
1916	220,095,808
1917	248,390,184
1918	524,316,572
1919	622,983,217
1920	390,228,909
1921	476,956,005
1922	844,263,519
1923	733,412,913

The production of hog-cholera virus for the same period is given as follows:

Year	Simultaneous	Hyperimmunizing
	c.c.	c.c.
1915	6,560.041	76,913,316
1916	7,597,403	70,138,873
1917	10,974,607	63,465,388
1918	16,171,423	137,833,334
1919	20,928,513	141,139,754
1920	22,443,378	87,338,709
1921	26,252,175	116,569,671
1922	36,298,200	184,742,961
1923	45,069,199	168,297,321

Data showing the number of average doses of other biologics produced by licensed establishments and placed in final containers, are given for each product from 1919 to 1923 inclusive. A summary of these figures indicating the number of doses of each class produced reveals the following:

	1919	1920	1921
Aggressins	4,938,254	4,850,798	3,027,919
Antisera and Sera (other than anti-hog-cholera serum)	1,596,233	1,691,326	1,009,976
Bacterial filtrates	27,896	25,882	1,060
Bacterins	12,065,936	9,826,806	5,444,890
Diagnostic agents (mallein and tuberculin)	955,540	1,267,520	1,467,360
Serobacterins	63,738	274,386	34,251
Serovaccines (bovine abortion and hemorrhagic septicemia)	23,100	395	1,525
Vaccines, viruses and toxins (except hog cholera virus)	7,677,984	6,908,467	3,692,908
Total doses	27,348,681	24,845,580	14,679,889

	1922	1923
Aggressins	3,966,566	4,434,047
Antisera and sera	1,288,089	1,283,781
Bacterial filtrates	3,504	6,621
Bacterins	7,338,713	10,549,679
Diagnostic agents	1,278,471	2,443,512
Serobacterins	109,985	34,075
Serovaccines	2,017	1,236
Vaccines, viruses and toxins	4,917,682	5,476,283
Total doses	18,905,027	24,229,234

This represents a little over 42,000,000 c.c. produced in 1923. This amount added to the quantity of anti-hog-cholera serum and virus makes a total of 487,700 gallons of biologics produced last year.

There has been a notable increase in the production of tuberculin, the output in 1923 being over six times the quantity manufactured in 1917. Another marked increase is shown in avian biological products, 4,676,655 c.c. being produced in 1923 as against only 219,450 c.c. in 1919.

Increases are also shown in canine distemper serum, bacterin and serobacterin, canine mixed infection bacterin and rabies vaccine.

There has been a marked falling off in the manufacture of porcine mixed infection bacterins, only one-fourth as much being produced last year as in 1919, while porcine hemorrhagic septicemia bacterin amounted to about one-third of the quantity manufactured in each of the years 1919 and 1920. The production of this bacterin having been fairly steady since 1921 may indicate that its use may be expected to remain somewhere near the present level.

A Week of Practice

By E. T. Baker, Moscow, Idaho

The following cases were taken care of in one week, and are typical of a general country practice in this part of the world. As with all practitioners, some weeks are crowded with work, while others are very slack. This may be taken as an ordinary week, between the very busy and fairly quiet ones:

Case No 1—Melanoma of two years' duration in a white mule. As the tumor seemed to be in a quiescent state, the owner was advised to leave it alone, and when it began to show signs of oozing or breaking out in other places, to lead the patient out in the woods for a long vacation.

Melanoma in white mule

Case No. 2—Sore foot, due to contracted heels, and a light touch of thrush. Some medicine was given, composed of gum camphor, sulphuric acid and turpentine, which has been found to work well on obscure cases of lameness. The foot was pared down, so that there was plenty of frog pressure. Improvement resulted in a few days.

Case No. 3—Ruptured stomach in a five-year-old mare. The owner finished seeding oats, and turned his horses out on a wheat field, with young wheat about six inches high. About two o'clock in the afternoon, this animal was found rolling and very badly bloated. Two doses of Raleigh's Bloat Cure were given, but no improvement taking effect, the writer was called about four o'clock, and found the mare covered with a cold sweat; the bloat had disappeared, and the temperature was around 105. A diagnosis of either a ruptured stomach or twisted gut was made, and a shot of lobelin, together with a capsule of colic medicine (anti-ferment and carminative) given, and a high rectal injection. An unfavorable prognosis was given, as all indications pointed to a speedy funeral. Between times, the trusty Graflex was used, and three typical snapshots taken of a fatal case of acute gastritis. Mare died about two hours later. Some may wonder why stomach tube was not used. After you see several hundred of these delayed cases, when you are called after all the damage has been done, you won't use much but something to give the animal a little relief from pain before death.

Case No. 4—Three o'clock in the morning, called out of dreamland to see a mare that was trying to foal. Found a six-year-old mare, with one foot of fetus exposed, head and other foot turned back. Changing into oiled suit, lubricated arms with wesson's oil, eight parts, and oil eucalyptus one part. Fixed wire stretcher, and got out obstetric chains. Tried to get head and foot of the fetus turned, and got head all right, but the mare began to fight and throw herself. Decided to yank colt out with foot turned back, as she had laid down, and absolutely resisted all efforts, even with hog-tying hind feet. Due to the fact she had had a colt before, after an hour of pulling on the wire stretcher, got the colt, which had evidently died during the night. Cut off afterbirth, and made no effort to clean her then. Gave a shot of camphorated oil, mixed bacterin, and left owner some echinacea and cascara to give every four hours. Turned her out in orchard, far removed from manure piles and other unsanitary conditions around barn. Might say this all occurred outside of the barn.

Next day the mare cleaned normally; and although swollen, soon came back, after being bathed with vinegar, salt and hot water, and then white lotion with belladonna applied to the parts and udder. Another shot of bacterin was given, and with plenty oats, fresh water, sunlight, exercise and old Doctor Nature taking charge, she made a fine recovery.

When a fetus dies, the quicker you get it away, and the less you irritate the uterus, and the farther you keep her away from the barn, the more success you are going to have. Most of this high-brow teaching about obstetrics is plain, unadulterated bunk. You can use seven dollars' worth of antiseptics and forty gallons of water irrigating the uterus, and all you will

accomplish after your hard work will be a first-class funeral.

Case No. 5—Ran a mallein test on 37 head of horses and mules for Alberta, Canada. Took sixteen hours for this, and took as many temperatures as was possible, although after one practices in the West for fifteen years as the writer has, he does not rush in madly to take the temperature of some little, meek-eyed cayuse or mule. One should look out for mange, glanders, influenza, and with the present outbreak of foot-and-mouth disease, see that freshly disinfected cars are used for shipping. However, the practitioner is in a good position to know about these diseases, and by making it a routine practice to palpate the submaxillary glands, take a squint at the inside of the nostrils, and a good, long look for mange, he will get by in good shape. Glanders is usually of the nasal type out here, although once in a while one sees a fine case of farcy.

Case No. 6—Gave a client some medicine for a sick cow. From his description she either had acute indigestion or something else, but as he was too economical to want to pay for a call to find out, why worry—it was his cow! One dollar and a half changed hands.

Case No. 7—Rancher with some small pigs reported them coughing, and not thriving. On investigating it, decided it was a form of "flu," combined with dust, as we have had no rain now for over six weeks. They were given the mixed bacterin, and mucoseptone and blue vitriol put in drinking water. Several died after this out of forty, but the rest straightened up, and got along fine. One has to be mighty careful not to get mixed up with cholera, but that assumes more of an acute form out here. We have a mixture of swine plague, hemorrhagic septicemia, so-called "flu," and once in a while genuine cholera. Potassium dichromate, in small doses, given in drinking water, will sometimes give good results in chronic coughs.

Case No. 8—Retained placenta in heifer, and if it had not been that the owner was "skeered" of contagious abortion, he would let it go until it rotted away. Good Christian rancher, too. About two gallons warm sodium chlorid and potassium permanganate solution was pumped in, and the afterbirth then removed. A capsule full of antiseptic (mostly boric acid) was inserted, and the heifer given a drench of regular bovine cathartic. A bottle of two ounces each of nux and cascara in Fowler's was left, and she got along fine.

Case No. 9—Same client had a horse with what he thought was mange. On looking through the hairs just below the mane a fine, thriving colony of hog lice were found. He was advised to use sheep dip and water one to forty, and then apply a salve, composed of sulphur, oil of cade, kerosene and vaseline. It is a very good ointment, and the writer always carries a pound of it for this kind of cases.

Ruptured stomach, 4:30 p. m.

Case No 10—Castrated a two-year-old colt on the way back to the office.

Case No. 11—Stopped at the county poor farm to see a horse recovering from influenza, and a cow with a small lump on her face, just below the eye. A few years ago, only two inmates were here, but now they have a full house, and several encamped in the pest house. On this account, I resolved to collect in some money. The horse was given a shot of bacterin, and some potassium iodid solution left; the cow was examined for an ulcerated tooth, but not a sign of anything found. Just what ailed her is a

profound mystery, unless she got a crack over the coco by some irate inmate as he thought of how he had invested in oil stock and had landed where he is.

Case No. 12—A large, handsome widow of the Barbara LaMarr type, (yes, the wife was home), drove in to see me about a cow. She said she had injured a teat (that is, the cow) by trying to hurdle a barb-wire fence. A traumatism ($2 extra for this word alone) had resulted, and the milk came out everywhere except through the normal channel. As the owner had been given good looks instead of money by an all-wise Providence, she was given some medicine for the wire cut, but told that she would probably have to send to Sears, Roebuck and get a new teat and quarter.

Case No. 13—Enamel points in a raw-boned, nine-year-old sorrel gelding. These were

Ruptured stomach, 5:00 p. m.

floated off, and a small bottle of Fowler's given to be placed on the feed whenever the owner chanced to think of it.

Case No. 14—Obstetric case in a ewe. A dead fetus had got wedged in at the pelvic outlet, and the owner was afraid to do anything himself, as he wears kid gloves to split the kindling wood. Using a well lubricated right hand, and attaching chains to both feet, thence to wire stretcher, the lamb was slowly pulled out. Always examine the uterus in a ewe, as there may be twins or even triplets. After care is secondary. Shiny trick obstetric instruments in these cases are a joke. If the ewe has been trying to lamb for several days, watch out for sharp bones sticking out and cutting your hand. A cut like this won't do your hands any good. When a ewe gets down on her side, and looks like a "wet" advocate trying to address a W. C. T. U. convention, give a prognosis of an ovine decease. The operation may be a success, but the patient dies in nine cases out of ten from septicemia.

Case No. 15—Eclamptic type of milk fever in a cross-bred Jersey and Holstein cow. Inflation, atropin and a big H. M. C. soon brought her out.

Case No. 16—Another acute indigestion in a cow, with bloat, that resulted in four dollars and a half being put in the family vault. Equine owners in this part of the country are so financially constipated the writer would drop dead if one were to pay cash, but the cream check boys ante up with joyful rapidity.

That evening a bowling team came over from Pullman and cleaned our outfit to a fare-ye-well. Some ranchers are going to suffer in the near future.

Case No. 17—Received a call Sunday afternoon to see a cow that was acting peculiar. She seemed to have something wrong with her internal gizzards, but just exactly what, is still a puzzle. However, she was given a drench of my old bovine stand-by, sodium hyposulphite, nux, ginger, turpentine and ether—together with three rumen tablets of the barium chlorid mixture. The next morning she was a whole lot better, and by the middle of next week was giving her usual supply of milk. Of course, there are some veterinarians so skillful they can diagnose every case at first sight, but the writer is not a member of this fraternity. He sees cases every week that puzzle him, and fifteen years of practice has taught him to do something instead of letting the animal die while diagnosing the case. The best way to do is to put yourself in the owner's place, and do everything possible to save the life of the animal.

Case No. 18—Wound up the week Sunday evening just before supper by getting a hurry-up call to a good paying client. It seems he had been out poisoning squirrels with strychnined oats, and eight head of horses had slipped in and picked up some. When found, two were in convulsions, and the rest feeling not as good as they might have. In the excitement, they all got down near a creek, and the two worst ones filled up on water. When the writer arrived, these two were defunct, while four others were in pretty bad shape. An H. M. C. with lobelin was given as quickly as possible to each one, and then a capsule full of tannic acid was

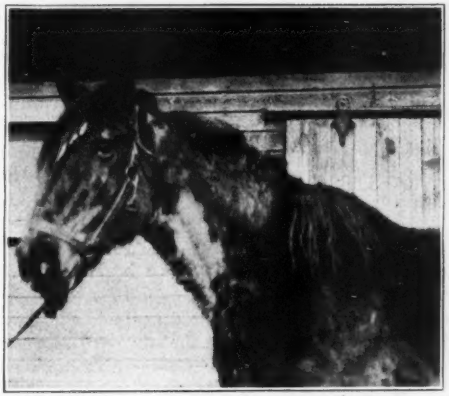
Ruptured stomach, 5:20 p. m., ten minutes before death

popped down. The writer carries a bottle of chloral hydrate dissolved in water, in which gum acacia is added. This is given both orally and per rectum with a two-ounce dose syringe, and it seems to help in controlling the muscular spasms. The six recovered, although were very lightly affected.

As this is a wheat country, we see quite a lot of strychin and phosphorus poisoning in horses, cattle, hogs and sheep. The ground squirrels are very common, and eat a lot of grain, so it is a universal practice among the ranchers to set out poison to get the rodents.

This closes the week. The calls have come in from early in the morning to almost midnight. The country practitioner has no time to call his own. Just as he sits down to dinner, in comes a call to see a bloated cow. When he gets all dressed to go to prayer meeting perhaps a poisoned dog case is on the docket. As he practices, he learns to conserve himself, and to take life easy when he can. There are medicines to prepare; the car to oil; the lawn to fix; instruments to be sharpened or greased, and a hundred other things to be looked after. The writer carries a Graflex camera and gets some good pictures of cases that would otherwise go unnoticed.

Another thing, it is peculiar how cases run in groups. Several fistulas, sweenies, and poll-evils may come along in a week. Then a bunch of influenza, then several purpuras and azoturias. Milk fevers and wire cuts with acute bloats are more prevalent before a storm. Horse practice is passing among driving stock, and a pound of blister will run me almost a year. Dog practice is better, particularly in winter. But the bulk of good paying clients own cattle and sheep, and after all, it is the man with money and who pays that gladdens the heart of the country practitioner.



Louse infested horse. Showing how the parasites work on the neck

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In the same class of disease to which foot-and-mouth belongs are included horse-influenza, horse-pox, horse-plague, cattle-plague, cow-pox, lung-plague of oxen, fowl-pox, fowl-plague, fowl diphtheria, roup, parrot-plague, rabbit influenza, ferret distemper, guinea-pig distemper, dog distemper, rabies, infectious catarrh of sheep, sheep-pox, hog cholera, yellow fever, smallpox, pyelomyelitis, and probably influenza, measles and scarlet fever of man, mosaic disease of tomatoes, and a host of other diseases of animals and of plants. In fact, nearly all the true contagious diseases belong to this ever-growing great class. Some of the infectious tumors of poultry, dogs and other animals are due to filtrable viruses.—The Veterinary Record.

The United States, with only about 5 per cent of the world's population, produces about one-seventh of its cattle, one-fifth of its wheat, one-fourth of its oats, one-third of its hogs, and three-fourths of its corn.

In a recent bulletin of the University of Wisconsin, it is reported that from material sent to the laboratory for diagnosis, Johne's disease in cattle has been diagnosed eight times. All of the positive specimens were from Wisconsin cattle. The bulletin goes on to say that as the traffic in purebred cattle increases, it is obvious that more attention must be paid to this disease, and the farmer and stockman cannot afford to ignore it. Its slow progress and insidious nature does not readily alarm the owner as would be the case with a more acute disease.

The Farriers of Gibraltar

By George Cecil, Paris, France

Slothfulness and a Favor

The two chief characteristics of the horse-shoeing business in Gibraltar are the comparatively small number of horses which are shod and the apathy with which the lazy "rock scorpions"—as the local Spanish farriers are known—go about their work. Indeed, the condescension displayed by the average swarthy Jack Spaniard suggests that in accepting the offer of a job the fellow imagines he is doing his patron a favor. He saunters through his work as though it were a pastime, and the exertion of shoeing one hoof may necessitate a drink of the country wine (which is extraordinarily inexpensive) and a **siesta.** Having refreshed the inner man Juan turns to and fixes another shoe, after which the sluggard again retires to the welcome shade of a bunch of cacti, and, stretching himself out at full length, rests an unshaven cheek in the hollow of a brawny arm, tilts a soft felt over roguish eyes, and sleeps for an hour or two. Sometimes the impatient Spanish groom wakes him and expostulates in the heated vernacular of the fiery South. The slothful farrier, however, is not in the least perturbed;—even when he learns that he will lose custom if he does not immediately complete the job, a contented snore is the only reply vouchsafed. But if the sluggard is very much in need of a few dollars with which to buy finery for the Carmen of his affections, or a flask of wine and a packet of cigarettes for himself, he may sleepily mutter the word **"manana,"** meaning that the task will be finished the next day. Always **"manana"** . . .

The "Rock" farrier never, by any chance, grows rich; nor, apparently, is Juan anxious to amass wealth. In fact, he does not save enough to buy himself the smallest annuity.

A Tour—And a Holiday

The clients include the mounted officers (who bestride chargers), subalterns and other warriors who can afford ponies, the members of the Calpe Hunt, and the farmers in the neighborhood. The farrier also numbers amongst his customers the carters who employ mules in place of horses, the mule, and even the jackass, being in general request as a beast of burden. The sure-footed creatures have no difficulty in climbing the steep, narrow streets of "Gib," and their powers of endurance are great. Fortunately for the good of trade, shoes wear out quickly, and though, from motives of economy, many a Spaniard puts off the evil day as long as possible, the services of the farrier, sooner or later, are requisitioned. He also has a large clientele amongst the country people who live on the outskirts of Gibraltar. Juan may spend a couple of weeks in each month going from village to village, from hamlet to hamlet, working for all who choose to employ him—from the local lord of the manor down to the peasant whose capital is represented by little more than his Castilian mule. If the tour is productive of a pocket full of silver, the farrier, on returning to the white-walled, flat-roofed hut which he occupies under the shadow of the batteries, leads a lotus-eating life until there arrives the evil day when he is reduced to his last copper. Then there is nothing for it but to live upon his friends, or to look for work once more. Having decided to turn an honest penny, the man of good intentions, lighting a **cigarillo** and cocking his hat very much over a protruding ear, saunters through the market-place on the lookout for information. Learning that some well-to-do Senor has dismissed his farrier for laming the best nag in the stable by cutting away too much of the toe, and armed with a few testimonials which are hired from the dealer in these wares, he calls to proffer his services. Juan also waits upon the various officers for whom he has worked before; and, seeing a mule which requires shoeing, the farrier pesters the owner till he is allowed to replace the worn-out shoes.

It must, however, be remembered that fear of starvation alone rouses him to activity. In nine cases out of ten the sluggard is content to sleep away the greater part of the day and to share a meal with some good-natured friend who has enough for two. As a rule, Juan is as idle as he is unskilled.

Borrowed Shoes

Except that he uses somewhat primitive appliances, the Gibraltar farrier's methods differ little from those in vogue in England, or, for that matter, in most countries. His files, hammers and knives, which he procures from Seville, are similar to those in use in other smithies, and his supply of nails is obtained locally. Should the idle one summon up sufficient energy, he spends part of his spare time making shoes; and if, upon a customer bringing him a

horse or a mule, none are ready, they may be borrowed from another practitioner. When called upon to shoe a fractious animal the farrier casts it, or uses a twitch; and if he sustains the slightest bodily hurt unusual activity is displayed in claiming from the owner of the obstreperous animal compensation which is out of all proportion to the damage done. 'Tis customary . . .

The Spanish fee is a small one; but the wind, fortunately, is tempered to the shorn lamb. Economical Juan manages to support a wife and to bring up a family, while he and his offspring seldom go hungry to bed. The fellow might be worse off.

Pig Tales by Kinsley

Several readers of Veterinary Medicine have requested an elongation and continuation of "Pig Tales." We predict that there will be less pig troubles during 1924 than there were in 1923 because there will be fewer pigs. There were less sows bred for the 1924 spring farrow than usual because of the relatively high priced corn and low priced hogs, and unless the spread between the price of corn and hogs is diminished there will be a relatively small fall farrow.

The little pig troubles some of which were related in the first five "tales," will have run their course before this is delivered to the reader, but other conditions may occur.

Tale No. 6

A story of eighteen litters of ninety-seven grade, big type, Poland China, farrowed and maintained in a hog house improperly lighted. The sows were provided a full ration of corn and cistern water during pregnancy and for a period of six weeks after farrowing. Three of the sows "broke down in the back" according to the owner and died later, probably from infection of bed sores.

The symptoms noted in these pigs were lameness, weakness, depraved appetite and diarrhea. There were bending and arching of the legs and some bony enlargement. Extensively affected pigs assumed the decubital position and expressed pain by squealing when made to move. Autopsy findings consisted of enlargement, particularly at the end of the long bones, and a thickening of the flat bones of the head and pelvis. The bone marrow varied from normal to a mass that was red in color and of a gelatinous consistency. The affected bones were usually so soft and spongy that they could be cut with a knife. There was a spongy layer beneath the periosteum in the affected bones. The nares and mouth may be practically obliterated by the enlarged, rarefied, nasal bones and hard palate. The alveoli may be swollen and the teeth appear deep set.

The diagnosis of this condition should not be difficult if the history, symptoms and lesions are taken into consideration. The condition is not tuberculous, neither is it paralysis, but it does fulfill the requirements of rachitis or rickets.

Treatment of rachitic swine is advised only in the early stages of the disease. The affected individuals should be placed in comfortable sanitary quarters and provided with a ration containing extra quantities of lime salts. The addition of codliver oil in quantities of from two to four ounces daily, for hundred-pound pigs, and phosphates in half to ounce doses, have given good results in most instances when the treatment was begun early. Green foods are of considerable value in these cases. Yeast has been lauded as a valuable adjunct by some veterinarians.

Tale No. 7

This is the story of nineteen pigs from three sows that had been farrowed and maintained on premises that had been used for swine for the past several years. According to the history there were a few shoats two years prior to that time that had distorted noses and irregular bulging of the facial bones and several pigs had been destroyed in the last year because of an ailment that affected the nose.

These conditions are rather prevalent and are responsible for the loss of large numbers of pigs, particularly in the older farmed sections in the corn belt.

The first symptoms noted in the herd under consideration, consisted of sneezing followed within a few hours or a few days with a discharge from the nose that was thin and watery in the beginning and later became purulent or mucopurulent. The affected pigs had a tendency to root in their feed but they ate little, consequently they did not gain in weight. In some of the cases there was a mucous or mucopurulent discharge from the eyes, and in a few instances the eyelids were closed together. Within the course of from two to four weeks,

there was noted a bulging of the facial bones which interfered more or less with breathing and the affected pig made a peculiar blowing noise. This condition is what is ordinarily termed bull nose, or is technically known as infectious rhinitis. It is possible that the B. pyocyaneus may be the active cause, although the disease is invariably found in pigs that are maintained on soil that has been inhabited with swine for several years.

Inbreeding may also be a factor in the occurrence of the disease. When the infection once occurs on a premise, unless extraordinary precautions are taken, it will persist and become more prevalent from year to year. Its first occurrence on a premise is usually noted by a small percentage of the pigs being involved, and within two or three years thereafter it is not unusual to find 20% to 25% of the pigs affected.

The principal lesions observed on postmortem examination consist of a catarrhal inflammation of the nasal mucosa in the beginning. Later there is a purulent inflammation and there may be variable sized areas of the mucosa destroyed. Bulging of the facial bones is a manifestation and the rarefying osteitis produces more or less deformity. In some cases the hard palate will be found involved and enlargement of that structure encroaching upon the oral cavity.

Treatment of this condition is not successful unless initiated in the very early stages and even then some of the cases cannot be relieved. Treatment that has been most successful consists of inhalation medication of some volatile agent, such as eucalyptus oil. Treatment should not be attempted in those cases in which there is involvement of the facial bones. The disease can usually be prevented by providing sanitary pens, properly ventilated hog houses, combined with proper swine management, and particularly seeing to it that inbreeding is not practiced too intensively.

Poisonous Plants

By L. H. Pammel

WHITE SNAKEROOT POISONING

The importance of white snakeroot poisoning warrants investigation. A number of experiment station botanists and the government have given us the results of their work. Of the more recent publications, mention may be made of the paper by Marsh and Clawson, Curtis and Wolf, Wolf, Curtis and Knapp, and the most recent by Drs. L. P. Doyle and F. L. Walkey, the botanical information being supplied by A. A. Hansen.

This recent paper indicates that while it is not as important as it once was, it is still important in some counties in the state of Indiana. There is recorded a case of poisoning near Lafayette, Indiana, where eleven cattle had partaken of the plant, and nine of them died. The symptoms were as follows: "There was complete loss of appetitie, and the animals showed a marked tendency to lie down. When they were made to move, they walked unsteadily and stiffly, with back arched; and some of them appeared to have difficulty in reaching the ground with the hind feet. Constipation was marked in some cases. While standing, especially after walking, some of the animals showed violent trembling."

Experiments were made with cattle, horses, chickens and rabbits. The rabbits were only depressed when fed; chickens died when fed fresh white snakeroot. The pig remained well. The plant also affects horses.

The conclusions of this good paper are:

"While it is generally believed that livestock do not eat white snakeroot unless there is a shortage of other pasture, a serious outbreak of poisoning from it was observed to occur in cattle in a part wood pasture where there was an abundance of grass in the unwooded part of the pasture. It may be that the cattle formed the habit of browsing the snakeroot in the wood while seeking shelter from the sun. The results obtained by feeding the dry plants indicate that if white snakeroot were to be incorporated in hay, the dry forage may cause poisoning in livestock.

"In white snakeroot poisoning, trembling was not found to be nearly as conspicuous a symptom in horses as in cattle.

"The susceptibility of chickens to snakeroot poisoning and the ease with which they may be given definitely weighed amounts of the various parts of the plant, suggest that chickens may be very useful in the investigation of poisonous plants."

IS THE BITTERSWEET POISONOUS?

Mr. W. H. Ward, of Ryan, Iowa, sends in the following letter:

"Is the bittersweet which has such beautiful blossoms in the fall poisonous? Would it be safe to transplant and have in the home garden or is the red berry poisonous?"

The bittersweet, which is a member of the Staff tree family, is known as Celastrus scandens and is not poisonous to touch. The berries, as well as the rest of the plant, can be handled without danger of poisoning. However, the reddish part of the bittersweet berry, which makes it so pretty, has a sweet, somewhat disagreeable taste and the leaves of the plant are poisonous to horses. A related plant, the Waahoo or burning bush (Evonymus) has an amorphous bitter, odorless substance, euonymin, which acts as a powerful heart poison. The Waahoo acts as a drastic purgative. The symptoms are those of deathly nausea, vertigo, prostration and cold sweat.

BOTULISM

The recent deaths from botulism in Oregon and Colorado have again renewed the interest in this disease caused by eating canned food containing Bacillus botulinus. The history of the Oregon case as given by Dr. Morris Fishbein and J. C. Geiger is as follows:

"On Feb. 2, 1924, the twelve members of three families named Gerbig, residing in Albany, Ore., sat down to a family dinner and reunion. Among the courses served was a salad composed to some extent of string beans which had been put up by Grandmother Gerbig two years before.

"Grandmother Gerbig was an experienced packer. She had been putting up stuff for the family for more than thirty years. Her food products had such a good reputation in the neighborhood that the friends used to beg her for a few jars of some favorite fruit or vegetable. The string beans were so much admired that on the occasion of this family reunion one of the mothers fed a nursing baby with a teaspoonful of the juice, and another started off her nursling with a string bean on which to chew as a pacifier.

"Sixteen hours after the dinner, two of the children at the dinner, aged 6 and 9 years, became severely nauseated. Then one after another members of the Gerbig family began to fall ill, so that forty hours after the meal every one present was seriously attacked. The first death occurred twenty-seven hours after the dinner. Then one by one, two or three hours apart at first and finally at longer intervals, the suffering bodies were overcome by the poison until every member of the Gerbig family had passed away.

"What did the special investigator of the United States Public Health Service find when he came to study the outbreak? On the shelves in Grandmother Gerbig's pantry there remained five jars of string beans from the same pack. Each contained enough of the poison developed by the Bacillus botulinus to do away with an entire community. The slightest taste of it was sufficient to cause death. Furthermore, the food in one of the jars examined was, so far as any ordinary observer could show, normal in appearance and in odor. The soil in which the string beans had been grown was saturated with the spores of the Bacillus botulinus.

"Outbreaks of botulism have occurred in practically every state and the bacillus that causes botulism has been found in the soil of practically every state. Recent studies indicate that the soil of certain portions of Alaska is singularly free from botulinus spores, and this soil is acid in reaction. Furthermore, the spores were found in greatest numbers in soils of mountain regions which had never been cultivated, and to the least extent in soils that had been intensively cultivated."

A GUIDE TO POISONOUS PLANTS AND WEED SEEDS OF CANADA AND NORTHERN UNITED STATES

This guide of 169 pages and forty cuts by Prof. R. B. Thomson and H. B. Sifton, of the University of Toronto, is a small, handy volume used as a text book to accompany a course on poisonous plants given to the students of the Ontario Veterinary College

The book has been divided into four sections based on the fatalities among animals. These are then grouped into those in hay pastures, concentrated feed stuffs, etc. A separate consideration of plants dangerous in ground feeds is a new one for a textbook on poisonous plants. As the matter will be of interest, I am inserting it here:

"Many plants have poisonous seeds. Indeed in many species there is a tendency for the poison to be collected from other parts of the plant and concentrated in the seed. These poisonous seeds are of great importance in Canada, where they form a considerable proportion of the screenings, millions of bushels of which are cleaned from grain annually. It

has been customary for millers to mix the screenings from the wheat they grind, with their bran and shorts. In the early days the screenings obtained at the large grain elevators of the west were destroyed, but of late years they also have been used in the manufacture of feeds. This practice, which has been fairly successful in the United States, has caused much trouble in Canada, where the screenings on the average contain a much larger proportion of poisonous seeds. The loss from this source has been confined, for the most part, to swine. Complaints have, however, come from men in other branches of the livestock business, especially those engaged in dairying, who claim that a great deal of sporadic abortion has been caused by the use of feed containing screenings."

The seeds mentioned here are poison darnel, purple cockle, cow cockle, wild mustard, tumbling mustard, wild pennycress, wormseed mustard, wild radish, flax. The following in regard to flaxseed is of interest:

"J. R. Dymond, late of the Seed Branch, Ottawa, received a sample of flaxseed screenings with the following statement from a farmer in Saskatchewan: 'A few weeks ago I fed some three gallons to a cow and two gallons to a heifer. Both were in convulsions in less than twenty minutes. The heifer died in about two hours, the cow in eight hours.' On analysis the sample was found to consist of immature flax bolls and chaff, 75 per cent. A chemical analysis showed a considerable proportion of prussic acid. Corroborative reports have come from other places where screenings containing immature flax bolls have been fed, and it is now an established fact that they develop prussic acid in sufficient quantity to make them dangerous in feeds."

The following plants are mentioned as poisonous on the range:

Plants dangerous when included in hay and coarse feeds—horsetails, bracken, skunk-tail grass, swamp camas, lupines and white snakeroot.

Plants dangerous in pasture or on the range—the sorghums, porcupine or spear grass, needle grass, cornstalk, death camas, false hellebore, California swamp hellebore, larkspur, monkshood, pasque flower, rose family, wild cherry, pea family, stemless loco weed, loco weed or milk vetch, heath family, water hemlock, poison hemlock, the water parsnip, sunflower family, ragwort, sneezeweed, white snakeroot.

Plants dangerous in ground feeds—grass family darnel, pink family, purple cockle, cow cockle, mustard family, wild mustard, tumbling mustard, field pennycress, wormseed mustard, wild radish, flax family, flax.

The symptom key to the principal poisonous plants is a most useful one. For instance, in those plants considered injurious to hay and corn feeds, there are the sub-divisions: A—mechanical injuries to mouth and throat, squirreltail; B—nervous symptoms variously sub-divided—horsetail, ergot, brake, etc. This work on poisonous plants should prove a very useful book for the student. It is published by the Toronto Press and the price is $2.50.

IS THE CASTOR BEAN POISONOUS?

Mr. John A. Campbell, of Stanley, Iowa, writes as follows: "I should like to know if castor oil beans (Ricinus) are harmful if eaten, either the plant or the bean?"

The castor oil bean is very poisonous. I make the following comment relative to castor oil bean in my Manual of Poisonous Plants:

"Castor Oil Seed and Abrus: One of the best known of the toxalbumins is that occurring in the castor oil seed, known as ricin. This albuminous substance is very poisonous, more so than strychnin and prussic acid. Ricin coagulates the blood.

"The seeds furnish the well known castor oil, which is a mild and safe purgative. * * * Castor oil is not poisonous, but the pulp contains an acrid, abluminous substance, ricin. Winslow, in speaking of the poisonous character, says, the seeds 'contain 50 per cent of oil and an acrid, poisonous substance. Three seeds have caused death in man, and they are ten times more purgative than the oil.' A few seeds eaten entire by a child might produce serious symptoms. According to Chestnut, the seed eaten accidently by horses has caused death. They are used also to poison sheep, according to some authorities. The oil cake is said not to be poisonous to poultry and cattle. A case is known of a young lady whose eyes became inflamed when in contact with a mere trace of the material in the laboratory."

Possible losses from bloating may be reduced or avoided by following the practice of holding the cows in corrals until the dew is off the feed, by giving dry roughage such as straw before turning the cows out, by accustoming the cows to new feeds gradually, and by not pasturing them when the feed is frosty.—Univ. of Cal. Bulletin 372.

Black Tongue in Dogs

By K. W. Franks, Minden, La.

Black tongue, sore mouth, cotton mouth, corn bread disease, canine typhus, infectious hemorrhagica, gastro-enteritis, Stuttgart disease, dog plague, are names which convey various impressions pertaining to the nature of this disease.

Definition: Black tongue is an acute non-contagious disease of dogs characterized by varying degrees of stomatitis, pharyngitis and gastro-enteritis.

History: The historical facts of this disease date back to the middle of the nineteenth century if we consider it the disease that Hutyra and Marek described as typhus of dogs. The earliest reports I have been able to obtain in this state are fifty years later, and as the disease seems to have disappeared in Europe, I doubt if the European outbreaks are of the same disease we term black tongue in the South.

In Louisiana the disease seems to have developed as the country was robbed of its forests, which drove the game farther into the swamps, and as the cut-over lands were converted into farms, it placed rigid restrictions on the dog, who formerly had free access to the forests and its abundant game, with which he had little trouble in satisfying his carnivorous appetite. It thus became necessary for dogs to be confined and for man to supply them with food. Meat was no longer so plentiful, and as the people had been taught from childhood that meat was injurious to dogs and responsible for internal parasites, corn bread was substituted for the dog's meat ration and is now his main article of food. So it is apparent that as the country has been transformed from a primitive forest to an agricultural state, the food of the dog has changed from ninety per cent meat to one hundred per cent corn bread in many instances.

Occurrence: While sporadic cases are reported from all parts of the United States, the disease exacts its heaviest toll in the territory south of the Mason-Dixon line or in that territory where corn rather than wheat bread is the staff of life. The disease is so severe in sections of the South and the mortality so high that the expression is often heard, "I can't have a dog any longer—I have black tongue on my place."

Etiology: That this disease is due to an unbalanced ration is believed by those better acquainted with it, and this theory is further substantiated by the fact that the disease is little heard of in cold weather, when fresh meat is abundant throughout the country. The possibility of black tongue being infectious seems very remote, as I know of dogs that have been associated with the disease all their lives without contracting it. The fact that one attack does not confer any immunity and in fact seems to increase the susceptibility unless attention to proper feeding is observed, points strongly to its non-infectious nature. The possibility of the disease being infectious and requiring an intermediate host which might be any one of the internal or external parasites so common in this country, must not be overlooked, but I will continue to believe the disease of dietary origin until research shall have proved its etiology.

A typical case of black tongue. Note saliva drooling from mouth

Symptoms: Loss of appetite accompanied by vomiting and diarrhea, are early symptoms.

* Presented at North Louisiana Veterinary Medical Association meeting, Shreveport, La., May 14, 1924.

Lameness is an early symptom in approximately forty per cent of cases. If the mouth is examined it usually shows a congested condition of the upper margin of the gums, which soon spreads over the surface of the mouth to the margin of the tongue, the whole mouth becoming a mass of sloughing, chocolate-colored tissue, emitting an odor which I can only describe as a "black tongue" odor. Profuse salivation is an early symptom, the saliva drooling from the commissures of the mouth. The saliva is at first thin and transparent, later becoming thicker and blood-streaked, and this becomes plastered over the chest and limbs. The abdomen is tucked up and painful on pressure. The eyes show a marked congestion and are sunken into their sockets. The temperature remains nearly normal. The animal can drink and eat only with great difficulty and, due to the pharyngitis present, is often unable to swallow after it has succeeded in getting food or drink into its mouth. Defecation is frequent and painful and varies from a slight diarrhea to alarming hemorrhages.

Diagnosis: The diagnosis is not difficult here where the disease is prevalent. The sudden depression, inappetence, unaccountable lameness, drooling of saliva, tucked-up painful abdomen, marked injection of the conjunctiva, and characteristic odor, are sufficient for diagnosis.

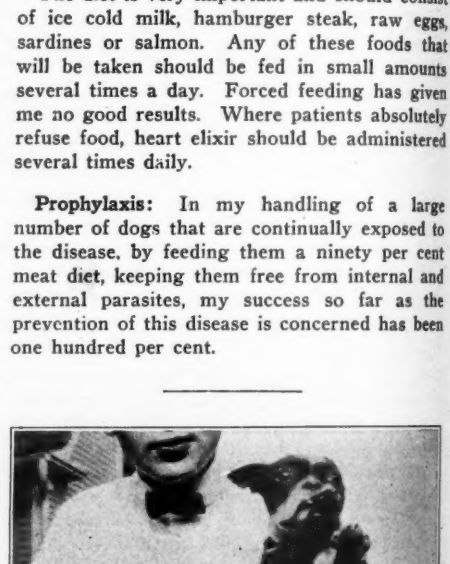
Differential diagnosis: The disease is frequently confused with dumb rabies, but the wild general expression, dropped jaw, thick tongue, dilated pupils of a rabid dog and the pleading, wistful, anxious look of a black tongue patient, drooling saliva from the corners of the mouth, which emits that characteristic odor, present few symptoms in common to one familiar with both diseases.

Course and prognosis: The course of the disease is from five to fifteen days, the course being somewhat shorter earlier in the year, the stomach and bowel complications governing the duration and prognosis. Where there is no hemorrhage of the stomach or bowels, the prognosis is good, a large majority of such cases recovering.

Treatment: Place the patient in a cool, quiet, comfortable place, much depending on good nursing. The medicinal treatment consists of intestinal antiseptics and a non-irritating mouth wash, salol and the medicinal dyes being ideal preparations. A weak solution of mucoseptone aids the sore throat and overcomes some of the offensive odor. An abundance of cold water should be before the patient at all times and should be removed and a fresh supply provided as soon as the animal has attempted to drink. Where hemorrhages from the stomach and bowels exist, opiates and intestinal astringents are indicated.

The diet is very important and should consist of ice cold milk, hamburger steak, raw eggs, sardines or salmon. Any of these foods that will be taken should be fed in small amounts several times a day. Forced feeding has given me no good results. Where patients absolutely refuse food, heart elixir should be administered several times daily.

Prophylaxis: In my handling of a large number of dogs that are continually exposed to the disease, by feeding them a ninety per cent meat diet, keeping them free from internal and external parasites, my success so far as the prevention of this disease is concerned has been one hundred per cent.



Favorable outcome of cesarean section in the practice of Dr. C. W. Sass, Toledo, Ohio

Developments in Veterinary Parasitology During the Past Fifteen Years

By Maurice C. Hall, Associate Editor

(Continued from June issue)

Diagnosis

Diagnosis of parasitic infestations of the digestive and respiratory tracts by means of fecal examinations has been in use for many years. However, the last 15 years have witnessed many refinements of technic in this connection. The primitive smear method still serves some purposes, but improved methods are widely used and most of these methods have either been devised or come into common use in the past 15 years. The variety in the existing methods indicates that workers in general prefer to develop such modifications of existing methods as suit their individual conditions, equipment and requirements. In general the methods involve simple sedimentation, burette sedimentation, centrifuging, screening or sieving, filtration, adhesion, staining, the use of water as a solvent or of various chemicals as solvents, levitation, flotation (separation by solutions of specific gravity higher than that of parasite eggs), and the use of cultures.

The intent in these methods is to eliminate non-parasitic material by taking advantages of the differences existing between such material and the parasite material as regards their physical, chemical and biological properties. Such manipulation results in the concentration of the parasite material, makes the detection of infestations more certain, and compensates in time saved in microscopic examination and in eye-strain for the time spent in technical manipulation.

The methods in use up to 1911 and 1912 were summarized in studies by Hall published during those years. More recent summaries were published in 1922 by Lane and by Quast and a less comprehensive summary, but with a valuable discussion of the parasites and non-parasitic material found, by Langeron and Rondeau du Noyer. Undoubtedly the feature of fecal examination which has been most intriguing and enticing to investigators is that of flotation. Bass first used this method in 1906, using a nine-tenths saturated solution of common salt to bring the parasite eggs to the surface. Subsequently Bass used calcium chlorid solution, Wellman used sodium acetate, Barber used glycerine and a saturated solution of magnesium sulphate, the technic subsequently being described by Barnes; Kofoid and Barber devised the brine flotation-loop method, using common table salt and removing a loopful of the supernatant fluid with a wire loop to examine it for eggs; Willis, Ginsburg, Gates, Tanami, Ariyama, Hobmaier and Taube, and Fehtkoetter used common table salt, Vajda used glycerine, Cochran used calcium chlorid, Tillman used potassium chlorid, Schuchmann and Kieffer used water glass, and Sheather used a sugar solution. These methods are very fascinating and in many cases very useful. With a well-stocked chemistry laboratory or the household pantry available there appear to be almost endless possibilities in the number of substances which may be tested in work along this line. In veterinary practice and in dealing with the eggs of tapeworms and flukes, as well as those of nematodes, it is the testimony of some observers that failures may follow the use of such methods where simpler technic, involving screening, sedimentation or centrifuging, and washing, is successful. The failures may be due to improper timing, variation in specific gravity of solutions, or other factors, but for routine purposes elaborate technic must be carefully checked or, failing this, it is advisable to use simpler methods.

The diagnosis of infestation with parasites outside of the digestive and respiratory tracts, and in some cases with parasites in these tracts, has developed along the lines of biological reactions. As was to be expected, the diagnosis of hydatid disease by complement-fixation tests has received quite a little attention. Fleig and Lisbonne in 1907 demonstrated a specific precipitin in the sera of patients infested with hydatids, the work being confirmed by Welch and Chapman. Ghedini, Bettencourt, Weinberg and Parva, Eckenstein and others, using hydatid fluid as an antigen, have demonstrated an antibody in the blood of patients, using a technic similar to that of the Wassermann reaction. Botteri notes that hydatid fluid is a true antigen and that it will produce passive anaphylaxis. He discusses a technic by which he claims he

can diagnose the presence of quite small cysts.

Similar studies with various flukes have shown results comparable to those obtained with the tapeworms. Thus Fairley reports that a specific complement-fixation reaction was obtained in cases of infestation with blood flukes, Schistosoma haematobium and S. mansoni, using sera from the patients and a specific substance occurring in the intermediate hosts, snails; this appears to be the first reaction of this sort known. The antigen was prepared from infested snail livers, in saline or alcoholic extract.

Nor have the nematodes been neglected in this connection. Trumpp has devised a skin reaction test for oxyuriasis, the test consisting of rubbing in an ointment composed of vaseline and pinworms with the subsequent development of a marked erythema in infested individuals, and in veterinary medicine Sparapani has recently reported a skin test for diagnosing verminous bronchitis in swine. Skin reactions with ascarids have received quite a little attention, Ransom having recently published a report on this subject, but so far the reactions appear to be of a toxic character rather than a character of value in diagnosing the presence of infestation.

Rearing Chicks Indoors

By D. C. Kennard

Why chicks have to run out of doors in order to live, avoid leg-weakness, and grow, has long been a puzzling question. If a method of feeding and care can be found which will promote the normal growth and livability of baby chicks indoors without leg-weakness and the other ills associated with confinement, certain phases of the poultry industry would be revolutionized.

Why it would be desirable to brood chicks indoors.—New possibilities in poultry progress await the successful growth of chicks indoors. In the first place it would mean that the baby chick as a market commodity would be largely replaced by pullets 10 or 12 weeks of age. In other words the poultry keeper instead of purchasing day-old chicks from the hatchery would be able to get pullets from a chickery. The hatchery has proved that specialization in that line is effective. The chickery, where chicks would be reared by thousands for the production of pullets, is the next logical phase of specialization. It is the pullet which is past the stage of artificial heat that the poultry keeper needs rather than the day-old chick. Especially is this true of the farm poultry keeper, since he is often poorly equipped for brooding chicks, and their care comes in direct competition with other farm activities. The result is that the chicks are often neglected and heavy losses follow. On the other hand, no one is in better position than the farm poultry keeper to provide the proper environment for pullets after they are past the brooder stage and ready for the summer range. At this time (May, June and July) the range and weather conditions are most favorable and the pullets require comparatively little time and attention.

A solution of the broiler problem.—Besides providing pullets instead of day-old chicks, the chickery would at the same time largely solve the broiler problem. The chickery having large quantities of broilers could market them to the best possible advantage. In some cases a feeding and packing plant would no doubt prove a desirable adjunct.

Develop heavy breeds earlier for winter eggs.—Another need for growing chicks indoors is that the heavier breeds could be given an earlier start than at present. Since a handicap of these breeds is the difficulty of getting the pullets developed so they will lay by the first of November, hatching the chicks at an earlier date than at present and brooding them indoors would aid greatly in the solution of this problem. As long as the poultry raiser has to depend on getting the chicks out of doors at the age of 2 or 3 weeks, his success is largely determined by the weather. It often happens that the weather is such that the chicks must be kept indoors for some weeks, especially if they are hatched in January or February or even sometimes in March. Since the chicks fail to thrive indoors after about three weeks, heavy losses and injury usually result from their confinement on account of the weather.

Coccidiosis and intestinal parasites avoided.—Among the important causes of chick losses are those due to soil contamination, particularly coccidiosis and intestinal worms. These troubles would be avoided by growing chicks indoors under sanitary conditions.

Need of specialists.—With the foregoing advantages to be realized from the brooding of chicks indoors, and the fact that brooding chicks

is the most difficult phase of the poultry business, the need for specialists to render this service is apparent. Once good pullets 10 to 12 weeks of age are available from chickeries at reasonable prices, there will be no more inducement for poultry keepers to brood the chicks than there is to do their own hatching at present, and the chickery would become as popular as the hatchery now is. The expected improvement over the present may be compared to that which has resulted from the modern hatchery. Take, for example, a hatchery with a seasonal output of 100,000 chicks, and suppose these chicks were hatched by 100 to 150 different amateurs using many kinds of incubators located in all kinds of places and compare the overhead and losses resulting from irregularities to that of the hatchery. A similar advantage could be expected from the chickeries over present methods of brooding.

But before the chickery can make much progress, a method of management and feeding by which chicks can be successfully grown indoors, must be developed. Then a specialist with one or two assistants in a well equipped plant providing every possible convenience could properly care for many thousands of chicks with but a fraction of the overhead time and expense involved in the crude methods now employed.

Recent investigations.—In the effort to solve this problem numerous experiments have been conducted at this station during the past three years, all of which resulted in varying degrees of failure until the last year when cod-liver oil was used in the ration. Work with albino rats, notably that of the Wisconsin station, had previously indicated cod-liver oil to be an exceptional source of vitamin A and the antirachitic factor. Since the vitamin requirements of growing chicks were known to be high, a concentrated form of the vitamins, such as found in cod-liver oil, offered a new possibility. In the first test the cod-liver oil was used in connection with a synthetic ration composed of purified foodstuffs but the usual failure of the chicks followed. When it was used at the rate of 5 per cent of a simple ration consisting of natural feeds it proved highly successful for growth without mortality or leg-weakness during the 12 weeks of the experiment; whereas the group of chicks receiving the same ration with skim milk and green sprouted oats instead of the cod-liver oil failed as heretofore. The basal ration consisted of equal parts of ground yellow corn and standard wheat middlings (shorts) to which was added 15 per cent casein and 4 per cent mineral mixture (bone ash 60, calcium carbonate 20, sodium chlorid 20).

The chicks were two weeks old at the beginning of the experiment. Cod-liver oil in comparison with skim milk and sprouted oats in ration of lots of 15 White Leghorn chicks each is shown by the results at the end of 12 weeks, as follows:

	Weight per bird pounds	Relative per cent growth	No. chicks with leg-weakness	Mortality
Basal ration plus 5% cod-liver oil	1.7	100	None	None
Skim milk to drink & green sprouted oats	.8	44	All	2

This and other experiments in the past indicate the failure of skim milk or green sprouted oats to meet the requirements of young chicks for growth and prevention of leg-weakness when confined indoors; whereas, cod-liver oil appears to be highly effective in this respect.

More recently, another experiment was conducted with day-old White Leghorn chicks taken directly from the incubator and placed on the experimental rations. Again the cod-liver oil ration proved successful but in this case only 2½ per cent was used in the ration. Another group received the basal plus 15 per cent raw egg yolk, which proved somewhat superior even to cod-liver oil. The basal ration consisted of ground white corn, standard wheat middlings, casein, and mineral mixture (same as in the previous experiment).

The results from feeding the basal ration alone, with cod-liver oil, and with raw egg-yolk to lots of 20 White Leghorn chicks in confinement: (These results were secured with the co-operation of Dr. R. M. Bethke):

	Average wt. in pounds at 6 weeks	Average wt. in pounds at 10 weeks	Relative growth in per cent at 10 weeks	Number with leg-weakness	Mortality
Basal ration alone	.24	(all dead)		all	20
Basal ration plus 2½% cod-liver oil	.60	1.42	100	0	0
Basal ration plus 15% raw-egg yolk	.75	1.59	112	0	0

It will be observed that the groups receiving the basal ration plus the cod-liver oil or the raw-egg yolk made practically normal growth without mortality or leg-weakness whereas the basal ration alone was a complete failure. It may be of interest to mention that one of the cockerels in the egg-yolk group crowed at the age of 22 days.

The method of feeding and management was very simple. Each group consisted of 20 birds which were placed in pens 2 by 6 feet. The wood floors were covered with about an inch of planer shavings. The chicks received the rations as stated in form of a dry mash, no scratch grain being fed. During the first three weeks they were fed the dry mash three times a day, receiving what they would clean up in about an hour. After this time the mash was left before the birds all the time. Until the end of four weeks each group was confined to a 2 by 2 foot floor space. In addition to this was an inclosed hover 1½ by 2 feet which they occupied at night. After four weeks the chicks had the entire floor space of the pen, 2 by 6 feet.

Suggestions for poultry raisers.—While the evidence cited indicates that it is not impossible to raise chicks successfully indoors to three months of age and secure about normal growth without mortality or leg-weakness, much remains to be accomplished before it can be regarded as applicable for general practice by poultry raisers. In the first place, the available supply of cod-liver oil or incubator eggs would be insufficient. Nevertheless, it appears that a limited application of these valuable supplements to the chick ration may be advantageously made by a considerable number of poultry raisers. Some will be able to secure cod-liver oil at a reasonable price, while others can secure for their cartage from the local hatchery all the incubator eggs they need.

If cod-liver oil is to be used, it can in most cases be secured in 1 or 5-gallon lots from the local druggist or from a wholesale druggist. While the price varies greatly, it can usually be obtained at about $2.50 a gallon. In feeding, the cod-liver oil is mixed with the dry mash at the rate of 2 per cent or 2 pounds (a quart) to each 100 pounds of dry mash. To incorporate the oil with the mash, the oil is first mixed with a small portion of the mash which is in turn mixed with the balance of the mash. For example, if it is desired to prepare 50 pounds of the cod-liver oil mash, 1 pound (or 1 pint) of the oil is thoroughly mixed with 5 or 10 pounds of the mash. Then this mixture is added to the remaining 40 or 45 pounds of mash and carefully mixed. Since cod-liver oil loses its valuable properties shortly after it is mixed with the mash, care should be taken not to prepare more of the cod-liver oil mash than will be consumed within 5 or 6 days. In other words, it is necessary to prepare a fresh mixture each week.

When it is desired to feed incubator eggs, the infertile and dead-germ eggs can often be secured in quantity from the local hatchery. To avoid any chance of infectious disease, especially bacillary white diarrhea, the eggs should be boiled a half hour. After passing them through a food chopper or sausage mill, they may be mixed at the rate of 20 or 30 per cent by weight with a dry mash composed of ground yellow corn, ground oats (sifted), standard wheat middlings (shorts), and bran, equal parts, to which is added 10 per cent meat scraps and 5 per cent fine bone meal.

The egg material mixed with the dry mash will make a slightly moistened crumbly mash, which may be fed the birds in open shallow troughs three times daily, being careful to feed only what will be cleaned up in 15 or 20 minutes. A very light feed of scratch grain may be scattered in the litter at 9 a. m. and 3 p. m, the scratch feed being fed sparingly for exercise so as to encourage a heavier consumption of the egg mash. In some cases it may be found advisable to omit the scratch grain altogether. The chicks may be given the egg mash after the third day in the brooder or just after they have learned to eat the scratch grain. Skim milk, if available, may be given the chicks to drink, in which case the meat scraps may be omitted from the mash.

These suggestions relative to the use of cod-liver oil or eggs apply particularly to early hatched chicks, which must be confined indoors on account of the weather or for any other cause. These agents may be regarded as specifics to be employed for meeting the emergency conditions arising from having to keep the chicks confined indoors. Later hatched chicks, that can be permitted out of doors after 2 or 3 weeks where they can get an abundance of green feed and sunshine, will have no need for cod-liver oil, but in the case of feeding incubator eggs it would be advisable to continue their use until the chicks are 8 or 10 weeks old, especially if skim milk is not available.—Monthly Bulletin, Ohio Agricultural Experiment Station.

Numerous tests and continual observation over a period of twenty-five years have well established the fact that minerals are of great importance in the metabolism of the dairy cow. The chemical action of the mineral salts assists in digestion and assimilation of proteins, carbohydrates, fats and crude fiber.—Erf.

Removal of the Odor Glands of Skunks

By Geo. R. White, M. D., D. V. S., Nashville, Tenn.

Novelty applies to surgical operations as well as to invention. The subject at issue in this instance is liable to confront any practicing veterinarian at any time. To deny being able to perform the operation would be similar to pleading ignorance or inefficiency, when you are supposed to be learned and proficient. To shirk or refuse to undertake the operation on account of the danger of becoming beclouded with the unpleasant odor pertaining thereto, would be equivalent to pleading guilty to being a moral coward, which is no enviable recommendation to a practitioner's skill and ability in these strenuous times of practice and professional rivalry.

The operation which I now attempt to illustrate and describe is unique in character and positive in its results. It is nothing more nor less than the removal—by surgical procedure—of the odor or scent-producing organs and their adjacent parts from the skunk. In other words, it is "deodorizing the skunk."

The two scent-secreting glands are situated laterally one on either side of the rectum, and in close proximity thereto. In fact their wall almost touches the rectal wall. In the center of these glands is a receptacle or sac, into which the gland secretion is emptied and stored to enable the skunk to defend itself against danger. From each of these sacs there is a duct or tube through which the fluid is discharged with considerable force—by muscular contraction—through their cone-shaped openings which pierce the rectal wall immediately inside the anus. The tail is first elevated, after which the discharge comes in a small stream from each of these ducts, by the rectum, first becoming everted, then almost instantly the muscular contraction takes place which empties the sacs.

Throwing this odorous fluid is the skunk's only mode of defense.

Technic of Operation

The surgeon should protect himself preferably by wearing a surgeon's linen coat, or in the absence of that, an ordinary raincoat will answer the purpose. Protect the hands by rubber gloves. Two assistants are necessary. They should also be supplied with coat and rubber gloves. It is decidedly safest and best to operate with the animal under a glass held securely by the two assistants. The glass protects the surgeon and at the same time allows him to see the field of operation. Clip hair off over site of operation, then with a small scalpel make two incisions one inch long, one-half inch on each side of anus (see Fig. 1). By pressing the gland between the thumb and forefinger and grasping it with a pair of vulsellum forceps, it may readily be dissected out, after which the duct that connects it to the rectum should be severed. The gland on the opposite side is attacked in the same manner. The wounds should

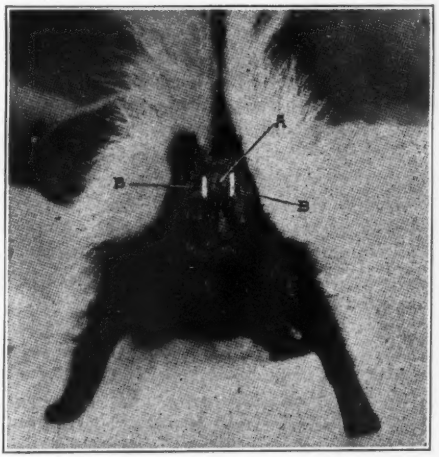


Fig. 1. Posterior view of skunk showing A, anus; B, site of the two lateral incisions

be left open to heal by granulation. The post-operation hemorrhage is usually very slight and requires no attention from the surgeon.

It is best to operate at from six to eight weeks of age, as at this time the glands are of sufficient size and firmness to be readily outlined by palpation. To undertake this operation upon kittens less than four weeks old is exceedingly tedious. The older animals suffer more from surgical shock than the young ones. The mortality will vary from 10 per cent to 40 per cent, according to age of animal and surgical technic employed.

When deodorized the skunk becomes an interesting and desirable pet; without deodorization it is nowise desirable about the household. The least provocation, pain or interruption will cause it to anger and expel this much dreaded odor-carrying fluid.

Where Bacterium Abortus is Found in Cattle

By John M. Buck, Pathological Division, Bureau of Animal Industry, U. S. Department of Agriculture, Washington, D. C.

The original investigations of Prof. Bang, the discoverer of the organism which we now term Bacterium abortus, revealed the fact that this microorganism could exist in the uterus and its contents, including the fetus, fetal membranes and uterine fluids. It was some years later before Schroeder, and Cotton, and Smith and Fabyan working independently made the highly important discovery that the infection is frequently present in the udders and milk of bovines. This discovery stimulated efforts to determine if it localized elsewhere in the bodies of cows, calves and bulls.

From the researches made it has since been shown that bulls occasionally harbor the infection in their scrotal sacs and seminal vesicles and eliminate it in their semen; that the microorganism may be found in the contents of the alimentary tracts of new born calves from infected dams for a limited period and that certain lymph glands and joint cavities of cows and bulls may occasionally constitute centers of infection.

Investigators have never been able to understand or account for the wide variation that exists in the length of time that udder infection can be demonstrated in different subjects which have contracted the disease. It may range anywhere from a few weeks to several years. Since failure has been experienced in proving that the organism commonly exists longer than six weeks or two months in cows, excepting in their udders and lymph glands associated therewith, its disappearance from these organs probably signifies in most cases that it is no longer present in the animal, and experiments have furthermore indicated that those animals which have ceased to eliminate the organism from their udders then possess a marked degree of resistance to the affection. On the other hand so long as udder infection persists it appears to act as a source of infection for the pregnant uterus although invasions of the latter organ may not always occur.

The records of twelve cows, all of which had Bacterium abortus infection of their uteri, is of interest in this connection. All of these animals eventually became pregnant. Following conception it was shown that Bacterium abortus was present in the udders of four of the number. Failure was experienced in demonstrating its presence in the remaining eight. Eleven of the twelve were then subjected to feedings of fetal material which contained large numbers of the organism. The eight cows which from the inoculation tests conducted, appeared to be producing Bact. abortus free milk, produced vigorous calves. Failure was experienced in demonstrating the presence of Bact. abortus in their uteri at time of parturition. Two of the four animals having udder infection following conception aborted the second time and from the uteri of all four at time of calving the abortion organism was isolated. If the results of this experiment represents conditions that commonly prevail following the infection of cows, then we are better enabled to understand why some animals abort but once and others two or three times. In this experiment between 60 and 70 per cent of the affected animals seemed to free themselves of the infection within a year or thereabouts from the time of first aborting, a circumstance which is cause for some encouragement when the matter of control is considered.

Those who have studied the pathology of the disease appear to be of the opinion that the udder tissue is little if at all altered by the presence of the infection.

Our work in connection with the study of bulls has failed to convince us that localization of the infection in their bodies is a common phenomenon. Bacteriological results were positive in but five cases when the genital organs of thirty-eight were subjected to bacteriological studies. All of these animals gave atypical or positive results to the agglutination test for this disease. It was necessary to make agglutination tests of over 300 bulls in order to obtain the number mentioned for cultural work. While the lesions involving the seminal vesicles differed considerably as to intensity, it was observed that from a histological standpoint a close resemblance existed in such cases as were encountered. These changes were always indicative of chronic inflammation.

(This is the third of a series of six articles on bovine infectious abortion by Dr. John M. Buck. The fourth article, on the elimination of bacterium abortus infection, will appear in an early issue.)

The use of a pair of pliers in opening hay bales instead of hacking with a hatchet does away with the danger of cutting off short bits of wire which may be swallowed by the cow and cause internal complications.—Univ. of Cal. Bulletin 372.

The Breeding and Raising of Minks

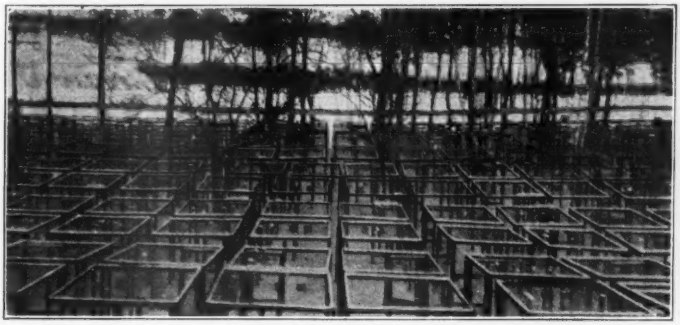
By C. B. Shore, Veterinarian and Secretary, Rest Island Silver Fox Farms, Inc.
White Bear Lake, Minn.

Big ideas do not drop from the sky. They come because someone is looking for them, and when found are made use of to the best advantage. So it has been with many branches of livestock production, especially so with the newer branches which include the rapidly developing industry of fur farming. Silver fox farming is indeed claiming the interests of those interested in the conservation of our few remaining species of distinctive fur bearers. This newly developed industry is fostered by both the American and Canadian governments and proclaimed by them to be a venture worthy of one's consideration. In conjunction with the production of this wealth producing fur bearer, there is rapidly developing the enterprise of producing the smaller fur bearers under domestic environments. Perhaps the most popular among the latter is the mink.

Location of Sites for a Mink Ranch

There are but few states that do not offer an opportunity for the production of minks, although those states possessing a cool, moist, humid atmosphere, with some freezing temperatures, are most desirable. Even some of the southern states, especially those possessing mountains or high altitudes offer a site location. In selecting a site suitable for a mink ranch consideration should be given drainage, and the surrounding environment should conform as nearly as possible to the natural haunts of the mink. In the wild state the mink is very fond of traversing small streams, depending to a great extent upon such a stream for a portion of its food supply, which is assured by crabs, minnows, and other small fishes that may abound in its waters. A clear brook, not subject to spring overflows or storms and heavy rains during the summer months, or streams having level or moderately sloping banks, provide an ideal location.

Pens or yardways may be constructed so as to include a portion of the running brook or stream which under such conditions might not insure a food supply, but the mink is fond not only of the fish he is able to obtain from such an environment in his wild state, but he is also fond of frolicking in the water. especially during the summer months. In the event such a site is not available, then a site possessing good drainage and shade should be selected. Soil with sandy or gravelly tendencies is desirable, but should such qualities not be possessed by the intended location, gravel or sand may be artificially supplied within the pen. Grassy plots may also be used, but do not possess as desirable features as the foregoing. Shade should be arranged within the ranch to allow the sun to enter the pen at different times of the day, yet protect the animal from the burning rays of the summer sun, which, in addition to being uncomfortable, also has a tendency to burn or turn the fur brown, resulting in a less desirable fur when presented for market purposes. Damp, moist, or soggy ground should not be chosen due to the fact that the confines of the animal are limited, and the foregoing factors contribute to the production of mosquitoes and other insects.



Mink Ranch of the Rest Island Silver Fox Farms, White Bear Lake, Minn.

Propagation Methods

Mink farming may be carried out under three different methods, namely:

(a) The natural method, wherein the animals

are given a wide range of territory and differ from that of the wild state in that they are fed by man and nests provided. This method is undesirable for several reasons. Selective matings cannot be carried out, it being impossible to separate the male from the female after the breeding season, and the young cannot receive proper feeding attention.

(b) The colony method wherein families are kept in houses known as colony houses, having a runway to a creek or stream, and

(c) The pen method such as is being used on Rest Island Farms, and which is being rapidly adopted by other breeders starting the venture. This method of production has proven very successful, not only for the convenience of operation, but the fact that proper care and handling are assured, while last but not least, this method of mink farming may be carried out with the least expense, a matter of consideration and importance to the beginner.

Constructing the Pens

Minks may be raised successfully in pens similar to those used by the fox breeder, except they are built on a smaller scale. Minks do not require a large amount of space for exercising. Framework of a mink pen consists of cheap lumber, painted or dipped in a wood preservative and of 2x3-inch dimension. Fir is most preferable of all woods, in that decay does not affect it for many years, while it is light and strong. A supporting framework consisting of the above 2x3-inch lumber is built, making a box in size 8 feet long, 6 feet wide, and 5 feet high. This framework is covered with wire, galvanized after weaving of 20 gauge, ¾-inch mesh. Allowance is made for an opening at one end of the pen provided with a gate to serve as an entrance to and from the pen. Wire is placed on sides, top and bottom, forming a complete enclosure, which does not permit the animal to escape from the pen. Where more than one pen is to be built a more attractive ranch may be had by placing the pens in straight, orderly rows, side by side, allowing a two-foot interval between each pen, to guard against fighting and possible injury between neighbors.

The kennel or nest box consists of a double-walled box, built on the principle of the fox kennel, except on a much smaller scale. Each kennel consists of a double nest compartment, each compartment being separate and having separate chute entrances. Each outer box is two feet in length, one foot in height, and one foot in width. Each inner compartment is 10 inches square, and allowance is made between the inner and outer compartments for an airspace of two inches. The chutes leading to the outside from the inner compartment or nest boxes are one foot in length, with an outer opening of three inches. Kennels may be built of cheap soft pine lumber, which may be painted a soft gray or white, materially adding to the preservation of the ranch. Kennels are but a small item of expense while but very little skill or labor is entailed in their construction. The pens are light in weight and may be readily moved to a new location by one man. During the late fall or early winter months inside kennels or nest boxes should be filled with fine upland hay, insuring the mink comfortable quarters and providing a warm place for the reception of the young.

Should a natural source of water supply not be available, then artificial troughs or bowls containing water should be provided each pen. Another desirable method of insuring constant water supply is the building of cement troughs at least 10 inches deep and 6 inches wide, constructed to extend through each pen. The trough should have an inlet and outlet, and fresh water should be kept in the troughs, especially during the summer months. If bowls are used a fresh water supply should be given each day. Troughs may be filled from wells, windmills, or piped from streams close by.

Surrounding the entire ranch a guard fence at least six feet in height, covered with galvanized wire of the same gauge and mesh as used in pen construction, should be provided to prevent the animal from possible escape should he become released from the pen in which he is confined, to prevent dogs or other stray animals from coming in contact with the animals, and to prevent trespassers from entering the ranch during the breeding season.

Handling the Mink

Untamed minks or those that have not been frequently handled when young have a natural tendency to bite. It is often necessary to transfer them from pen to pen during the breeding season, or to move them for other purposes. This may be readily accomplished by means of a small box having a trap door at each end. Such a box should be 3 feet in length, with an inside width of 4x4 inches. Small holes may be bored into the sides of the box providing sufficient air supply. In transferring animals from pen to pen one end of the box is closed, the remaining end of the box allowed to remain open and placed at the outer chute opening. The mink within the kennel is chased through the chute into the open end of

the transferring box, after which the slide is closed and the animal carried to its destination. They are also readily handled by the wearing of woolen mittens covered with heavy leather mittens. Unless the minks have been frequently handled when young it is advisable to select one of the above methods for personal comfort.

Breeding the Mink

Minks as a general rule breed but once each year. However, cases have been reported among breeders where females whose litters were known to have been lost, bore young twice within the period of one year. However, records of this nature are exceedingly rare. The breeding season among minks extends from the latter part of February to the latter part of March. The gestation period is approximately 43-47 days, although cases are on record where females have carried the young for a period of 57 days. Litters vary in number from two to eight, being blind and hairless when born, resembling young rats in appearance. They develop rapidly, in three or four months are usually weaned by the mother and shortly after appear outside the kennel. At this age they should be taken from the pen and placed separately. Young minks are of a playful nature and means for their entertainment should be provided within the pens, in the form of such articles as hollow tile, wooden chutes, or hollow logs.

A Domesticated Mink at the Rest Island Silver Fox Farms.

Minks will breed and bear young in the spring following that in which they are born. The male mink is a polygamist, and will capably serve from five to seven females during the breeding season. Extreme care should be taken at this time of the year by the keeper, due to the fact that some females will not accept the attentions of the male, when placed with them, but instead will resent his advances, sometimes resulting in permanent injury if not immediately removed.

Mink ranches, like other fur ranches, should be closed to visitors during the breeding and pupping season. The keeper or caretaker should be the only one permitted within the ranch, until the kittens are old enough to take care of themselves. The young should not be disturbed even by the keeper until one week to ten days old, and in the process of examination to ascertain the number and welfare of the litter, it is best to chase the mother from the kennel, closing the outer chute with a cloth or sack to guard against her re-entrance.

Feeding Minks

Considering the ultimate value of minks, feed is comparatively inexpensive. They are exceedingly fond of small fish, chicken heads and feet, milk, meat in the form of beef or horse meat, fed ground, except during the pupping season, when it should be fed only in chunks, sparrows, and other birds, corn meal, green foods, gophers, ground mice, and ground squirrels. Minks are fed but once each day except the females during the breeding season, when they are fed twice each day, to provide for the growth of the coming litter. It is important that the feeding process be carried out regularly each day. Fresh water for drinking purposes except during the winter months when snow is present, should be supplied daily, if not already provided within the pens.

In selling minks for breeding purposes females are sold for more, due to the male being of a polygamous nature. Ranch raised minks sell for higher prices than those trapped in the wild state and used for breeding purposes, because the former are usually larger, tamer, and breed more readily.

Possibilities in Mink Farming

Success in mink farming can be obtained only by careful observation, a study of the habits of the animals, and regard for the laws of nature governing their existence. Minks are unlike many of the other fur bearers in that they are not of a nervous disposition, which renders it

possible to breed them in almost any locality, in the doctor's back yard or hospital lot, in close proximity to farm or other buildings, even within the confines of large cities. Their production affords an interesting form of profitable diversion for the doctor, business man, farmer, and his boys. Minks in the wild state are becoming alarmingly scarce, while the demands of fashion for the mink pelt is rapidly on the increase. It has been but a few years since the pelt of the mink was considered of little value; today we find it has steadily advanced, with no assurance of a future supply.

Mink farming is as yet somewhat in the experimental stages. However, it has been proven by breeders that these animals can be successfully raised under domestic surroundings and that the pelt they produce under such environment is better than any that ever came from the wild state. There is no doubt that much will be learned from the experiences of those engaged in their production at the present time. There need be no fear of an over-production of this animal by too many people becoming engaged in the venture. The demand far exceeds the supply at present, and since all chance of replenishing from the wild state has passed, the only possible source of future production must come from the mink ranches that will be found throughout the country in years to come.

Items of Interest to the Practitioner

By A. T. Kinsley

Isolation of the cow at and following calving is the prime factor and the most feasible method of the control of abortion disease in cattle.—F. A. Rich.

It may seem at first thought that milk plays an important part in various ailments in the human, and that certain diseases are milk borne is self evident and not denied by any investigator. But if one-third of the population is in the habit of drinking milk or using milk or some of its products there would be in the United States over 35,000,000 people daily consuming milk and its products and if disease transmission is very common, there should be a large number of diseases originating from milk. The facts are that the percentage of milk borne diseases is very small, almost insignificant. The requirements by some cities of pasteurization to prevent spread of disease through milk is splendid, providing the pasteurization is efficient.

It was originally thought that the healthy animals were the important thing. Somewhat later it was realized that the healthy herd was the unit to consider in tuberculosis and only very recently is the importance of the tuberculosis-free community beginning to be felt. Many are coming to see that the health of his neighbor's herd is almost as important to him as is that of his own.—E. G. Hastings, Bact. J.

Absence of milk from the diet or the inclusion of unfavorably modified milk is the origin of most serious diseases. No other article can replace milk. Xerophthalmia occurs primarily because of deficiency in vitamine A that is derived from butterfat.—Bloch.

According to Hastings, people living in cities have little to fear from bovine tuberculous infection. This statement is made on the assumption that cities maintain and are in a position to enforce efficient pasteurization of milk. We do not believe that there are many cities that are effectively pasteurizing their milk supply. It has been shown recently that the pasteurizing equipment in some of our larger cities are sufficient to pasteurize less than 50 per cent of the milk that is actually reported to be pasteurized daily. It is usually conceded that an inefficient pasteurization is a dangerous procedure.

Dependable Dobbin Pome

Old Dobbin may be out of date,
And just a little slow,
But Dobbin didn't have to wait
On deeply drifted snow;
He hauled and carried folks and freight
When autos wouldn't go.

—Walt Drummond,
K. C. Journal-Post

It has been demonstrated by the Department of Agriculture that flushing of ewes at breeding time increased the number of lambs produced.

Organotherapy has been heralded by a few as a means of combating a variety of pathologic conditions that may occur in various tissues and organs of the animal body. It is true that the derivatives of the thyroid and the

extracts of the pancreas containing insulin have been proven valuable in certain disease conditions of the thyroid and diabetes; however, many other organotherapy products are in the experimental stage and some of them may prove valuable.

The sweat glands were formerly considered an auxiliary of the kidneys. More recently it has been shown that the sweat glands eliminate a fluid that contains small quantities of salts and therefore evaporates rapidly, whereas urine contains salts in varied proportions. The chief function of the sweat glands is elimination and evaporation of fluid thus regulating body temperature and the chief function of the kidneys is elimination of salts and the products of katabolism of nitrogenous compounds. The only compensation of kidneys and sweat glands is in elimination of water. Sudorifics may, therefore, be used to lower body temperature under certain conditions but not to compensate for an altered kidney function.

Chlorin has been found to be of value in relieving acute congestion of the mucosa of the respiratory passages in the human. It is reasonable to assume that similar results may be obtained in the relief of the same condition in lower animals. Will it be possible for transportation companies to arrange a system of chlorinating animals in transit and prevent the coryza and other conditions caused by inhalation of cold air, irritating gases and foreign bodies incident to shipment? The future of medicine no man can foretell.

The application of results already obtained concerning the structure, life history and bionomics of parasitic worms to the prevention and treatment of disease requires the attention of specialists in the field of medicine if adequate results are to be achieved. Ultimately, then, the problems which are developed and carried to a more or less successful solution by parasitologists require for their fullest utilization co-operative work from the specialists in the medical field.—Ward,—Science.

Zinc sulphocarbolate and aromatic sulphuric acid, when properly combined and administered, are of value in controlling calf scour.

Some reliable physicians have said that quacks are beginning to prosper in the practice of human medicine because of an apparent shortage of physicians. This condition will probably occur in the practice of veterinary medicine unless a larger number of qualified young men enter the veterinary colleges.

It has been conclusively demonstrated that angular leaf spot and wild fire, two destructive bacterial diseases of the tobacco plant, are frequently introduced into non-infected soil by the sputum of the users of infected chewing tobacco. It is apparent that tobacco is not a universal disinfectant and the possibility of the spread of infection by sputum is indicated.

It may be possible to rear chicks indoors until they are ten or twelve weeks of age without the development of leg-weakness or loss from other causes. Kennard recommends the use of two and one-half per cent of cod liver oil to be added to the feed for chicks that are to be kept entirely indoors. If the cod liver oil proves successful in preventing the losses of baby chicks kept indoors the raising of poultry will be simplified.

According to serum tests, Malta fever in the human may be caused by the B. abortus Bang of bovine origin. It is thought that some of the atypical cases of fever in the human may be due to the B. abortus. The fact that abortion infection is transmissible to the human should stimulate abortion disease control in cattle.

Recent investigations by Drs. Draper, Dunn and Seegal, of the Presbyterian Hospital of New York, suggest the possibility of "physiologic form" as an indicator in diagnosis. Thus, short, heavy humans are more frequently afflicted with diseases of the gall bladder than those that are tall and thin. It is not claimed that a certain "physiologic form" actually causes disease but that certain types inherit influences or a predisposition. It would be interesting to know whether or not form or type of domestic animals is a factor in the occurrence of disease.

Milk in some form is a very valuable feed for poultry. Some poultrymen recommend buttermilk, others skimmilk, and still others claim that sweet milk is indispensable in poultry culture. The feeding of milk keeps poultry thrifty and therefore more resistant to diseases of various kinds. Some investigators claim milk added to the diet of chickens prevents coccidiosis.

Six grams of biniodid of mercury and eight

grams of potassium permanganate dissolved in one gallon of water make a stable stock solution of a valuable intestinal antiseptic for poultry. This combination has been successfully used in chicken cholera by adding one tablespoonful of the stock solution to each quart of drinking water and prohibiting the fowls from obtaining other than the medicated water. This solution in conjunction with chicken cholera bacterin has been successfully used in checking several outbreaks of fowl cholera.

Sows generally contract infectious abortion from each other rather than from other species of animals such as cows, ewes, or mares. This practically eliminates the possibility of swine becoming infected from drinking the milk of aborting cows, or of catching the disease from other livestock. The infection is usually introduced into a clean herd by purchase of infected swine.

Vaccination of sows and gilts in infected herds with live culture vaccine about three weeks before breeding is advised as a means of preventing abortion infection. So-called "carriers" of the disease are not likely to be established by the use of the vaccine; neither is the vaccine likely to cause permanent injury. A small per cent of sows and gilts fail to conceive after vaccination, but this is as often attributable to other influences as to the vaccine.—Hadley & Beach, Cir. 169, Wis.

A new theory of immunity has been proposed by Besredka of the Pasteur Institute in Paris. Besredka asserts that immunization is the result of resistance of the local tissues through which infection gains entrance. In accordance with this theory it is claimed that an immunity to typhoid fever or Asiatic cholera can be obtained by ingesting dead B. typhosus, or the microorganisms that produce cholera. The Duncan theory of autotherapy that was propounded several years ago corresponds closely to the Besredka theory and according to reports this theory of preventive medicine was found wanting on actual tests. If the Besredka theory is correct, those infections that are ingested such as abortion disease in cattle can be controlled by feeding killed cultures of the microbes that produce the disease. If this assumption is correct, calves that are fed pasteurized milk containing B. abortus Bang should be immune to abortion disease. Investigations are constantly opening new fields and suggesting new treatments and he who reads not will soon be left by the wayside. Unfortunately, some statements are published before they are verified and therefore he who reads should accept only those statements that have been proven.

It has been demonstrated that butterfat production gradually increases up to the seventh or eighth year of age in the average cow, and then gradually decreases. This age factor in butterfat production occurs in all breeds of cattle. In some individuals it has been found that the greatest butterfat production occurred at approximately nine years of age, while in other cases it occurred at less than seven years of age.

The presence or deficiency of anti-rachitic factor and calcium salts in the mother's diet during conception, pregnancy and lactation, control to a considerable extent not only the general nutrition of the offspring, but particularly its skeletal development and the eventuality of the appearance of rickets.—Korenchevsky.

The use of sodium fluorid has been extensively recommended in the treatment of external parasites, particularly of poultry. Some few cases of death due to the toxic effect of sodium fluorid have been reported, although it would seem that poisoning from the use of this drug has been relatively rare. Death due to the toxic influence of sodium fluorid occurs within three to four hours, ordinarily. The poisoning in these cases is due as a rule to the accidental ingestion of the drug. Thus far, all cases reported that have shown toxic effect, have terminated fatally.

Truche recently reported avian typhoid in the Bulletin, Soc. Jr. Vet. Med.

In this discussion there is given a rather detailed description of the geographical distribution, symptoms and bacteriologic diagnosis of avian typhoid, as well as a rather complete description of the method of treatment of this disease. The author recommends polyvalent vaccine prepared from cultures of B. pullorum and two types of B. sanguinarium. The dosage employed was from 1 to 3 cc, depending upon the size of the fowls, whether they were turkeys, chickens or geese. The results obtained by the aforementioned Truche were apparently satisfactory.

It has generally been assumed that the finding of B. coli in water was an indication of sewage pollution. It has recently been suggested that

it is possible for various representatives of the colon group to become saprophytic and that this fact must be given consideration in passing judgment on the bacteriologic examination of a water supply. It is true that ground water should be free from B. coli but on the other hand the unconditional condemnation of soil water because of the B. coli is not warranted.

D'Aunoy recently reported a spontaneous recovery of rabbits from experimental rabies. (J. Inf. Diseases.) This is rather interesting although some unauthentic cases had been previously reported, but the records do not indicate many recoveries, even from rabies induced by a fixed virus. The saliva from the case in question in which the rabies was induced produced rabies in rabbits. The saliva of the rabbit that recovered from the rabies was not infectious at the end of forty days.

Disease Resisting Power of the Domestic Fowls

By B. F. Kaupp, Raleigh, N. C.

Where any considerable number of birds are brought together on limited grounds, disease is certain to appear among them sooner or later. The greater the number of birds kept on any given area, other things being equal, the sooner disease will appear, the more rapidly it will spread, and the greater will be the loss from it.

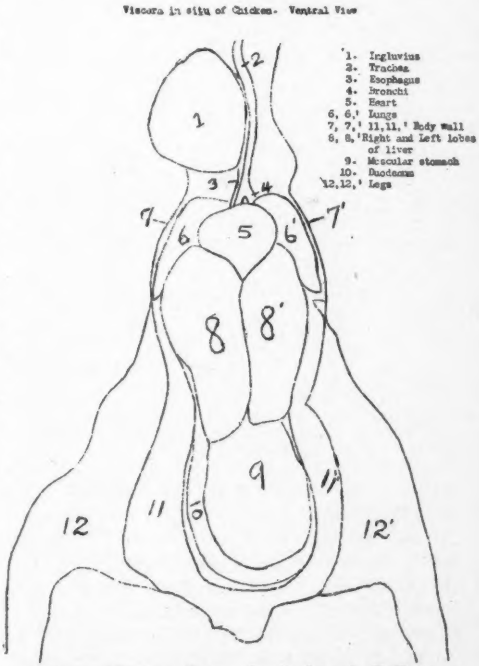
All intelligently directed measures to prevent or delay the appearance of disease in a flock, all sane measures to limit its spread and encompass its eradication, constitute sanitation. Measures the purpose of which are to cure sick birds or relieve their suffering come under the head of therapeutics.

On farms of considerable size, where attention is given chiefly to general crops, and comparatively few fowls are kept on a practically unlimited range, the loss from disease may be small, even though indifferent or bad sanitation prevails; but on large poultry plants, where intensive methods are adopted and the number of birds is large for the size of the range, there can be no assurance of continued exemption from disease unless reasonable sanitation is enforced. Any attempt to operate a large, intensive plant in insanitary buildings and yards, or under conditions that do not permit of sanitation, while it may be successful for a time, will result in loss oftener than otherwise, and in the end must inevitably fail.

Immunity and Natural Resistance

Immunity literally means proof against disease, that is, it is the name of the condition that enables an animal to resist the action of the disease-producing germs or to be unaffected by their products. Immunity is only a relative term; the condition is not absolute and permanent, neither is it constant and continuous. Whenever a bird is unable to adjust itself to its environment, it becomes susceptible to the effects of the causative agents of disease, that is, its immunity, at least acquired immunity, is suspended.

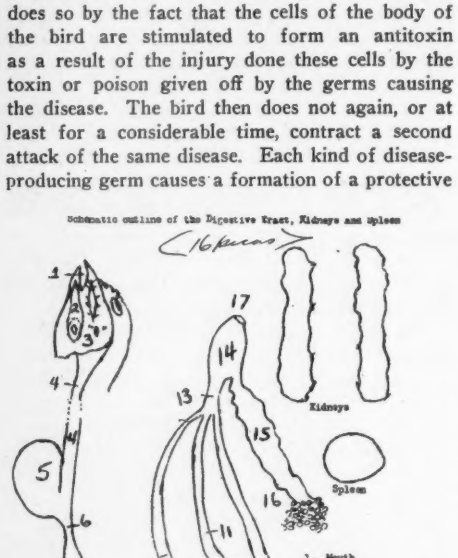
The term immunity is ordinarily used in reference to infective diseases, that is, disease resulting from the invasion of germs, or bacteria.



(From Kansas State Agricultural College Pathology Bulletin)

While there is an acquired immunity or proof against disease—which is a resistance in the form of antitoxin built up in the body as a result of being vaccinated, as in the case of vaccination against cholera, or roup and sorehead—there also

is a natural resistance resident in the body of the bird from hatching time, and it is not the result of a stimulus, as in the case of vaccination, or passing through an attack of the disease. When a bird recovers from a contagious disease, it does so by the fact that the cells of the body of the bird are stimulated to form an antitoxin as a result of the injury done these cells by the toxin or poison given off by the germs causing the disease. The bird then does not again, or at least for a considerable time, contract a second attack of the same disease. Each kind of disease-producing germ causes a formation of a protective



(From Kansas State Agricultural College Pathology Bulletin)

substance by the cells which will kill that germ and none other.

In every outbreak of contagious disease we note some birds who do not contract the disease. These birds have a natural immunity. We also note that where birds have poor sanitary surroundings contagious diseases are more prevalent because the natural resistance of all the birds is lowered. All birds have more or less natural resistance, but the susceptible ones that contract disease have less resistance than those that do not contract it under good sanitary conditions. A good example of lowered natural resistance is given in the classical test with anthrax germs on fowls and is as follows: The fowl is naturally immune to anthrax germs, and if in good physical condition will not develop anthrax after being inoculated with the germs, but if the bird be subjected to a chamber kept at a high temperature for several hours and inoculated, it will then develop the disease. In this test the natural resistance was lowered by subjecting the hen to an unusually high temperature. The bird contracts the disease.

Factors Which Will Lower Natural Resistance of Fowls

In our investigational work of the causes of disease, both contagious and non-contagious, we have found in many cases, as a cause, improperly constructed houses with dirt floors that are uneven and lower than the surrounding ground. The dirt floors are foul, not having been cleaned out for months. The perch poles in such houses frequently are found placed at an angle from front to back instead of horizontal, with no dropping board. The floor is invariably damp, or even wet. The sides, back and top of the house show cracks which allow drafts and rain water to pass through. Under these conditions resistance to disease is sure to be lowered and the fowls may become sick at any time. The death rate always is greater under such conditions.

We know of one large breeding establishment where bad floors and mite-infested houses were used. The death rate among the male birds alone for 1916-1917 and 1918 was 20 to 28 per cent. These houses were replaced by concrete floors with cinder and crushed rock under drainage and modern superstructure. In these modern houses the egg yield has been greater and the loss in birds has been but nine per cent. The normal percentage loss among birds is approximately 10 per cent. The keeping up of the natural resistance to a high state did it. To put it another way, the birds have been kept in good health by proper sanitary measures.

Keeping Up Resistance in Chicks

Ground upon which birds run after a while becomes "fowl sick" with the excreta of the birds. That animals will die in their own filth if they are not properly looked after is true. Ground upon which young chicks are raised must be kept pure. The best way to keep it pure is by spading up the ground and growing green feed upon it. An illustration may not be amiss here. One plant we know of had trouble raising chicks in small inclosures in which chicks had been raised for a number of years. The inclosures were small and never had been allowed to grow up in weeds. The party was advised to grow a

few crops of rape on it, and after growing six successive crops of rape and cowpeas, chicks were raised to twelve weeks of age, at which time they were turned out on range. Continued cropping of these enclosures now for the past five years has made possible raising chicks on this ground. It was the turning over of the ground, allowing the sun to penetrate the soil, allowing the rain to leach down the filth, and the plants to utilize the organic matter, that purified it. It made the polluted ground pure again.

Atmospheric Surroundings Must Be Favorable

In locating a poultry house or poultry plant, one should shun the place where the mists, fogs and vapors settle and remain. The currents of atmospheric moisture naturally follow down the slopes of land and come to rest in the inclosed valleys and swamps. In these places one notices at night the cool and often chilly, moist, heavy air which has settled and stagnates there. When fowls are required to live in such stagnant air, saturated with moisture, they tend to become mopish and debilitated, indicating a lowered resistance, and they readily succumb to roup, sorehead and other devastating diseases.

The ground selected for poultry yards should have good drainage, preferably sloping to the south, and gravelly soil, smooth and free from pools of stagnant water or a stagnant, saturated, foul soil. Sandy, sloping yards dry off soon after rains. Grass will use organic matter.

Helpful Hints in Equine Practice*

By L. A. Merillat

THE IMPORTANCE OF EXAMINING SURGICAL PATIENTS

A veterinarian is called to an establishment to examine a lame horse. Being an experienced practitioner and an able diagnostician of equine claudications, he makes a very systematic examination. He notices the horse knuckles on one hind leg as he backs from the stall. On walking off only the toe of the affected leg touches the floor. Trotted, the anterior stride is short and there is a characteristic flip of the foot as it is lifted from the ground. After trotting, about, the lameness improves. He flexes the hock acutely for a minute and finds that on trotting off again the lameness is more pronounced.

Inspection and palpation of the hock reveals a slight enlargement at the antero-internal aspect. He learns that the animal has been showing signs of lameness in the morning for several weeks, improving with exercise and becoming lame again after rest. He diagnoses spavin and recommends firing. The diagnosis is right and the treatment is standard. The owner, however, is not inclined to submit his horse to such radical treatment—treatment that will blemish and that may not cure the lameness—and consequently withholds his consent momentarily to await developments.

About two weeks later the patient is still lame and on one particular morning is found pretty well disabled. The horse walks on the tip of the toe, holds the lower joints rigid and does not improve with work. Believing the horse to be getting worse from the spavin, the owner takes it forthwith to the doctor to be fired. "He's getting worse, Doc. I guess you'd better fire him," says the owner on turning over the horse to the attendant at the hospital door. The doctor otherwise engaged directs the patient to a stall to await his convenience. The attendant is directed to clip the hock preparatory to the firing when there is found time to do the job.

Later in the day without any further examination, the hock is fired and the patient turned over to the owner with directions for its care Six days later the horse is still very lame and pus is found discharging from the heel. On search for the cause, a nail is found still impinged in the lateral lacuna of the frog.

Such an occurrence is not a warning to examine the foot of lame horses, as every experienced veterinarian does that, but it is a warning to surgeons to reexamine patients just before operating. Various accidents can befall patients between the time of examination and the time of operating, even though only a few hours have elapsed. If several days intervene it is a very serious sin of omission to neglect the careful pre-operative physical examination of surgical patients.

* In response to requests from readers, we are reproducing this series of practical articles by Dr. L. A. Merillat, written in 1915-16, and considered by many as representing this author at his best. These discussions are quite as applicable to conditions today as they were when first published in Veterinary Medicine, nine years ago. Moreover, they serve to focus attention on a phase of practice which there appears to be a tendency to neglect in some quarters.

AZOTURIA FOLLOWING OPERATION

A large, well fed, well groomed and regularly worked draft horse in splendid condition of flesh is brought to the hospital affected with a sore back—a harness bruise. It is found hot, painful, edematous and with radiating lines extending down over the upper part of the ribs. The horse is affected with a subcutaneous abscess which might, as every veterinarian knows, attack the supraspinous ligament and prove troublesome or even develop into a fistula of the withers.

Being a good horse and in the hands of a sympathetic attendant, absolute rest and hot fomentations for four days are recommended pending the development of the abscess. At that time the patient is to return for the lancing. Having been annoyed for four days with the attempts to bathe the painful back, the horse so viciously opposes any handling of the affected region that it is thought advisable to secure him on the operating table. He fights the twitch, the belts, the hopples and when turned down struggles incessantly while the abscess is washed, shaved and evacuated. The whole body of the animal is bathed in perspiration and the breathing accelerated.

When the horse is returned to the standing position, the gluteals are found to be hard, the hind legs collapsing and the whole body trembling. He is affected with an acute attack of azoturia.

This accident which occurs very frequently is one of the greatest misfortunes that can befall a veterinarian. The explanation that the horse did not die from the operation is never accepted very gracefully because the restraint was a part of the procedure and the whole management, including the four days of rest recommended, was in the hands of the practitioner. Azoturia from surgical operations is excusable when horses a few days idle are brought some distance right to the operating table and then unfortunately develop the disease while they are under restraint. The surgeon under these circumstances may have no reason to suspect the patient is susceptible, but when the patient has been under treatment before the day of operating and no steps were taken to avert this accident, the responsibility is ours.

In operating upon horses in good condition—the kind that are susceptible to azoturia—it is always well to act carefully, to warn, to postpone and to prepare against this unfortunate event.

CASTING A YOUNG RICKETY COLT.

A colt apparently in fair health, but affected with an invisible unmineralized condition of the skeleton, is cast for castration. The tying is not well done; the hind legs are too loose and push forward toward the elbows. Instead of stopping to rearrange the half tied members, the operator proceeds with the operation, thinking the tie is good enough for such a harmless creature.

During the painful part of the procedure, the hind legs are braced against the ropes, the back is roached and in this curled up position, a severe struggling tenesmus ends with a dull breaking sound. When the operation is over and the patient has been with difficulty raised to the standing position, a femur or a tibia is found to be fractured. Often it is the separation of the diaphysis from one of the epiphyses of either of these long bones, at other times it is the fracture of the shaft. Either is serious, fatal.

The prevention here is found in tying all patients well; tying them so that the legs are folded into a helpless flexion, instead of ever attempting even the simplest operation upon a half secured subject.

FACIAL PARALYSIS FROM IMPROPER RESTRAINT

Without an assistant to protect the animal's head against injury, a horse is placed upon an operating table. The head is simply fixed to the table with the rope of a five-ring halter. The surgeon and his assistant are occupied with some other part of the body; the head is thought to be safely secured against injury During the long drawn out preparation and performance of the operation, the body of the animal from the struggles is pushed forward tightly into the halter, the rings of which press hard and long against the temples.

When the patient rises, the upper lip is crooked, drawn to one side, and the under lip is dangling at one corner, exposing the buccal mucous membrane. The patient has facial paralysis. The rings of the halter have bruised and probably permanently damaged one of the facial nerve trunks that surmount the inferior maxilla just below the tempero-maxillary articulation.

This accident occurs in every degree of severity, from a transient paralysis lasting only a few hours (sleeping nerve) to a grave permanent impediment of the whole side of the face.

The prevention is found in the use of a round, soft rope halter placed always over, and never under, the padded hoodwink. Furthermore, the head of a horse secured on an operating table should not be fixed with a rope. It should be held with a rope run through a slot in the table, by an assistant who will "give and take" as the head moves about.

BRACHIAL PARALYSIS FROM SECURING LEGS OF PATIENTS

An undersized horse or colt is secured on an operating table of standard size without making any change in the belts and hopples. When turned down the feet barely reach to the hopples; the legs are stretched because the distance between the body-belts and the feet is too long for a horse of that size. On returning the subject to the upright position, the foreleg that was undermost collapses under the weight of the body; it cannot support weight. The diagnosis is brachial paralysis.

One or more of the radicals of the brachial plexus were injured by stretching as the weight of the body while struggling pulled heavily against the fixed foot. There are likewise different degrees of brachial paralysis. In long drawn out operations, the leg may "fall asleep" from prolonged pressure of the plexus in horses of any size, but if there is no nervous injury, the infirmity shown on arising is transient, passing off in a few minutes or at least in half an hour.

When this accident occurs in small horses and shows no sign of improving after some hours, there is reason to be alarmed because here some nerve has been more or less permanently injured. In some cases recovery occurs only after several weeks, and rare cases atrophy and never entirely recover the full use of the leg.

Legs of small horses secured on an operating table should never be fixed firmly at the feet. It is better to give the feet considerable freedom of movement at the hopple so that lunges of the body do not stretch the legs. Furthermore, a second set of hopple holes placed closer to the belts should be provided for small animals. These will be found useful in securing small horses, jacks, small mules, colts and cows, whose legs are too short for the appurtenances of the standard tables.

CASTING AN AGED HORSE

Almost everyone knows about the dangers attending the casting of old horses for more or less painful and prolonged operations. Sometimes we are drawn into this trap almost unconsciously. A horse fifteen or sixteen years old is about to be fired for a spavin, ringbone, strained tendon or some other condition. In clipping the field it is found the patient is ticklish and is already putting up an opposition to the threatened interference with its comfort.

After the field has been clipped and the twitch and sideline have been safely and firmly adjusted and placed in proper hands, it is found that every touch of the iron is suddenly met with an acute wince and when attempt is made to glide the heated instrument over the field the patient lunges about in spite of every effort to control it. When the patient becomes heated into a profuse perspiration, fighting vigorously the restraint, as well as the firing, it is decided to complete the operation in the recumbent position.

The very much excited patient now is cast and tied, probably with a hurriedly improvised apparatus. When the limb has been positioned and the firing resumed, the patient continues to struggle, wiggle, strain and fight incessantly. Suddenly a dull thud is heard; it is thought from the character of the sound that a tie rope has broken. The struggles are now less violent and confined to the fore part of the body; the hind extremities are limp. The knowing surgeon is aware that the sound was something more than the breaking of a rope. The lumbar vertebrae have fractured.

This accident while fortunately not so very common does occur at least once in the lifetime of almost every veterinary surgeon. The victim is usually the young practitioner who has neglected to recognize the potential hazard that lies in the backbone of an aged spavined horse, that is vigorous enough to put up a formidable fight against restraint.

Two lonesome skunks by the roadside stood,
As a little Ford sped by;
And the odor it left was far from good,
And a tear stood in one skunk's eye.

"Oh, why do you weep?" said his anxious friend;
"Why do you sob and quake?"
"Because that smell," said the other skunk,
"Is like mother used to make!"

—Pickup

Agalactia in Sows Relatively Common

By A. T. Kinsley

Veterinarians have occasionally reported individual cases in which there was a sudden cessation of milk in sows and occasionally there have occurred several instances in which agalactia developed in from eight to twelve sows on one farm within a few days.

According to most veterinarians, this condition is of considerable importance because it is difficult to overcome, and it is of importance to the breeder because of the loss of numerous suckling pigs that die from starvation.

The exact method in which the mammary gland cells produce milk has not been definitely determined. The stimulus for milk secretion may be an internal secretion in part and it is thought that suckling or milking is also an important factor. Experimentally it has apparently been demonstrated that the injection of placental extract is capable of stimulating milk production. Agalactia may be a symptom of parenchymatous mammitis, although many of the cases that have been carefully examined appear to have no relation to any inflammatory process in the mammary glands. Most cases of agalactia occur within three to five days after parturition and usually the first indication of the disease is the gauntness, weakness and persistent attempts to obtain milk by the pig.

This condition probably has no relation to the character of the feed or that of the sow as it has occurred under all conditions. The age, breed and general condition of the sow are apparently not a factor, in at least many of the cases. It is thought by several investigators that the primary cause of agalactia is due to some disturbance of the endocrine glands.

To prescribe either a preventive or a curative treatment for agalactia without knowledge of the specific cause would be empiric; however, maltine and other like products are highly recommended by some veterinarians. Ground or cracked barley soaked from 12 to 24 hours, the length of time depending upon temperature, makes a splendid substitute for maltine and is relatively easily prepared and cheap. No doubt, soaked barley or maltine would be of much more value as a preventive than as a curative agent. It is possible that if soaked barley was fed for a few days prior to farrowing and for two weeks thereafter, the occurrence of agalactia could be prevented. Extract of placenta and mammary glands have been used with favorable results. Such products are not on the market but should be given a trial, at least in valuable animals.

One of the serious consequences of agalactia is the loss of the suckling pigs. The successful feeding of so-called orphan pigs is economically worth while not only in pure-breds, but also in grades. It is advisable in the feeding of any mammalian orphan to provide a food that approximates as closely as possible the composition of the mother's milk. According to different investigators, the approximate composition of sow's milk is fat 7%, albumin and casein 6%, sugar 5:7%, and ash 1%. The fat globule of sow's milk is about one-fourth the diameter of the fat globule of cow's milk and is therefore more easily digested. The average sow produces from four to seven pounds of milk daily. The average litter varies from eight to ten pigs. Therefore, the average pig consumes about one-half pound of milk per day.

In caring for orphan pigs whenever possible they should be permitted to suckle another sow, at least once or twice, then they can usually be fed on a modified milk. A modified milk that has been fairly successful in supplying the demand of orphan pigs is prepared as follows:

1 lb. cow's milk.
1 lb. lime water.
¼ lb. separator cream.
⅛ lb. sugar.

If milk sugar is available and not too expensive, it will be more satisfactory than cane or beet sugar. The ingredients aforementioned should be mixed in clean, sterile vessels and pigs from one to ten days of age should be given approximately one-half pound equally divided into four or five different feedings daily. The basic principle that pigs should not gain in weight until they are ten days of age should always be kept in mind when feeding orphans. After the pigs are ten days old, the composition of the prepared milk can be gradually changed by reducing the lime water, cream and sugar, and when the pigs are three weeks of age they can be fed on whole milk from the cow. Pigs from two to three weeks old can be given small quantities of grain. Great care should be used in the feeding of orphan pigs. All utensils should be clean and sterile. It is not necessary to provide a nurse bottle. If the prepared milk is placed in shallow vessels, the pig will soon

learn to drink therefrom.

By following out the foregoing general directions, thousands of orphan pigs can be saved annually.

Veterinary Medicine will be glad to have suggestions not only as to successful cases of agalactia in sows and other domestic animals, but also the care of mammalian orphans.

A FERTILE MARE MULE AND SOME FACTS OF HER FOALING

1. Article published in *Farm and Ranch* Dallas, Texas, under date of June 12, 1920, entitled "Days of Miracles." This article signed by L. T. Branham, Montalba, Texas, owner of the mule, gave a statement of the foaling of the mare mule to the service of a jack. The date of foaling was June 1, 1920. The article also included a picture of the mare mule and mule foal.

2. W. L. Stangel, Professor of Animal Husbandry, visited L. T. Branham and arranged for the loan of the mare mule and foal to the A. & M. College of Texas for experimental work. At the same time he secured affidavits from the owner and his neighbors certifying the foaling of the mule colt.

3. The mare mule and foal arrived at College Station, Texas, August 11, 1921. She was bred to a jack that month and rebred in September but failed to foal in 1922.

4. Mare mule was bred October 25, 1922, to a saddle stallion, Pat Murphy, and foaled a living stallion colt September 26, 1923.

5. The colt is bay in color with white markings. He has all the characteristics of his sire with one exception—his ears are a trifle long. He is of average size, strong and healthy. He is a true horse in head, breast, hips, flanks and feet.

6. The age of the mule at time of foaling was approximately 22 years. Age of sire at time of service was 17 years.

7. In addition to the members of the Animal Husbandry Department staff, the following members of the faculty will vouch for the authenticity of the mare mule's foaling: Dr. Mark Francis, Dean of the School of Veterinary Medicine; Dr. R. P. Marsteller, Professor of Veterinary Medicine and Surgery; Professor E. J. Kyle, Dean of the School of Agriculture.

8. The mare mule and her two foals are now the property of the Animal Husbandry Department of the A. & M. College of Texas.

TETANUS IN A MARE

I observed a case of tetanus that might be of interest. This case was diametrically opposed to the one reported by P. F. S., in the June issue. His case died in spite of huge doses of antitoxin, my case recovered with no other treatment than a sympathetic look.

On the first of April a client called for medicine for what he had diagnosed as a light case of azoturia. I hesitated, but he insisted on my giving him something, so I put up an eight-ounce bottle of diuretic. On the 8th of April he called to inform me that the medicine was doing no good. He asked me to drive out to see the horse. I found a blind aged mare with typical tetanus. I said above that this horse received no treatment; it did get the eight ounces of diuretic and it made a marvelous recovery and was one of the main horses in putting out my client's corn crop. I will not divulge the formula of this diuretic; if future trials prove successful, I contemplate a land office business with my miraculous tetanus cure.

I might conclude by saying that I recommended absolute quiet and darkened quarters for this horse. My recommendations were easily carried out. The owner of this horse was a grass widower, deaf and dumb and living alone with a 15-year-old son. As to the darkened quarters the horse was blind.

John B. Bryant

Mt. Vernon, Iowa

PERFORATE FORAMEN OVALE IN COLT

A two-day-old colt was noticed by the owner to be acting as though he had an attack of colic, upon which the owner administered a dose of castor oil, which, however, failed to give relief. The colt seemed to be rather weak when born, and at no time had been able to stand alone while nursing. After asking a number of questions over the telephone, the owner invited me out to see the patient.

Upon arriving at the farm, I found the little fellow in one corner of a well-bedded box stall, muscles quivering and an occasional rolling on the withers as though it was in pain. The region over the heart was palpated and I found the heart was beating very rapidly. The pulse could not be detected at the submaxillary, caudal or median region. The ears and legs were cooler than normal, though not what one could call cold. The movements of the bowels appeared about normal. Pressure over the abdomen would cause a sort of groan and slight

puffing breathing but no particular symptoms of pain. Pressure over the region of the heart caused more uneasiness. Temperature 99° F. Expired air cold to the touch. The peculiar action of the heart caused me to apply the stethoscope over the region of the heart and well marked sounds of regurgitation could be heard.

After all these symptoms were carefully considered, it was decided that we were dealing with a case of perforate foramen, and the owner was informed that death would follow. The following morning the colt was dead and an autopsy performed. After massaging the auricles a little, it was noticed that the blood was rushing back and forth from auricle to auricle. Careful dissection showed the opening very nicely. Although this is the first case in which I was able to locate the foramen in young animals, as I look back I am satisfied that it occurs much more frequently than we suspect.

W. P. Bossenberger

Williams, Iowa

USE OF STOMACH TUBE IN GASTRO-INTESTINAL DISTURBANCES OF HORSES

For the last three years I have been using the stomach tube in almost every form of colic in horses, with very good results. It pleases the owner to see the veterinarian try something out of the ordinary for his horse. It is a very satisfactory way of administering medicine, as you will avoid that tiresome process of drenching. The procedure in introducing the stomach tube is as follows: I lubricate the tube with dairmol, insert it into the left nostril, using my left hand, and with the index and middle finger of the right hand I guide the tube by pressing downward on the floor of the nasal cavity so that the tube will take its right course to the pharynx. If resistance is met or a cracking sound is heard, then I know that the tube strikes the ethmoid or turbinated bones; the tube is withdrawn a little and tried again. When the tube reaches the pharynx the animal almost always goes through a movement of deglutition and the tube is then quickly pushed down.

Hemorrhage can always be avoided if the operator is careful, so that no injury is caused to the turbinated bones. After some experience, the tube can be introduced in less than a minute's time.

In cases of impaction of the colon and cecum, the stomach tube is introduced and three gallons of water, in which one pound of sodium chlorid has been dissolved and some nux, gentian and aromatic spirit of ammonia added, is administered. If the fecal matter of the impacted parts is very hard, then another three-gallon quantity of tepid water is given. In case of fermentation, one-half ounce of formalin is very beneficial. I usually follow with an aloes cathartic ball.

The animal shows improvement rather rapidly. In three to four hours the pain ceases, the fecal matter softens up considerably and peristalsis begins.

The solution of sodium chlorid makes the animal very thirsty and the owner is instructed to supply the animal with all the water it will drink. I prescribe some nux and gentian to be administered every six hours. The horse, as a rule, makes a rapid recovery. Out of 155 cases of gastro-intestinal disturbances in which the stomach tube has been used, 140 recovered with one treatment, 9 required a second treatment, and 6 were fatal, due to complications such as volvulus, acute tympany with rupture of the inflated intestine where no relief could be given by enterocentesis.—C. M. Christy, Univ. of Pa. Veterinary Extension Quarterly.

COLIC DUE TO ATMOSPHERIC CAUSES

The word "colic" has come to be a mere name for a condition in the horse manifested by rolling, tumbling, pawing, looking around to the side and general uneasiness. These are the usual manifestations of abdominal pain in this animal and are spoken of as "colicky symptoms," and pains producing any of these symptoms, even though due to other and well known causes, e. g., azoturia, are referred to as "colicky pains."

It is my belief that atmospheric causes play a very important part in the production of these digestive troubles which we term colic. Of course, if we accept this explanation, we must allow that colic is produced through disturbances of the nervous system. The greatly increased number of cases of colic during the very hot, sultry days in the spring or any other time of the year argues forcibly for the importance of atmospheric causes in the production of colic in horses.

No one can deny the importance of exhaustion and improper feed, but these conditions alone do not explain the occurrence of a large number of the cases that we are called upon to treat. A change of feed even though the feed be good, of course, stands in the relation of cause to many cases of colic, but do not atmospheric or climatic changes produce fully as many if not more cases?

I have come to the conclusion that the sultry day has much to do in bringing on cases we see on these days. On such days the horse more easily and surely tires to the point of exhaustion not only in muscles but in his entire body as well, and when feed is given, the intestinal tract is in no condition to receive it; the digestive fluids are unable to handle it. As a result, the warm, moist feed quickly ferments with the formation of irritant acids and other products. This irritation causes the stomach to secrete a watery fluid admixed with blood. The stomach is soon tightly filled and the stretching and irritant contents occasion a great deal of pain.

Further evidence that the day and the work has really more to do with the condition than the feed, is seen in the frequency on sultry days with which we see cases that have worked apparently without showing anything abnormal while working, more than a sluggish gait and apparent weariness. None of the violent pains are shown when the horse is unhitched, and when placed in the barn the animal stands with his head down, doesn't eat, nor seem to notice anything, does not want to move; his breathing is somewhat hurried, but not alarming, and the temperature but slightly above normal. These symptoms show little change for a couple of hours, when the horse becomes restless, paws some and acts as though he would lie down, but shifts his position instead. This will mean that if taken out of harness at six p. m., about eight or eight-thirty, you get a call from the owner telling you he has a sick horse. He is not bad, but doesn't act right and he won't eat.

These are the cases where I think atmospheric causes are the most important ones. Again we often get cases on such days that have not been at work. Horses that have been standing idle very often have as bad cases as those that have been at work, except that the sour condition in the stomach is absent. The other symptoms will be nearly the same.

In the treatment of the cases mentioned, the first and most important measure is the removal of the fermenting, irritating mass from the stomach. This can be done only with a stomach tube. If permanent relief is not secured after emptying the stomach once, it should be used again when the symptoms indicate its need, for in these cases there is often an antiperistalsis which again fills the stomach in thirty to forty-five minutes. A third application of the tube may even be necessary, but one thing is certain with this line of treatment, there will be no ruptured stomach at the end of three to five hours, which is often the case with any other mode of treatment.

You do not have to explain to your client where a stomach tube is used that you are sure the autopsy will show some rupture. Of course, a ruptured stomach is incurable and usually absolves the veterinarian from blame in the eyes of the owner of the animal, but when the tube is used at the beginning this condition will not ensue. Medicinal treatment is uncalled for in this type of colic.—D. O. K.

MISSING A CALF IN UTERO

There is no doubt that it is quite an easy matter to miss a calf **in utero** under certain conditions, though it may require some courage to admit the soft impeachment. A calf in the peritoneal cavity four days after the commencement of labor is nothing to be surprised at, for we have only to surmise the uterus passing into a state of tonic contraction, and at the same time the fetal tissues becoming invaded by gas-producing organisms, for the accident to happen. Rupture of the uterus takes place and, as the calf gets bigger, the rent increases, and the position of the former may at any time become extra-uterine.

I have certainly been surprised now and again at having done a fair amount of exploration, etc., in delivering a cow, without having become suspicious of the presence of a second calf. It is best then to make sure in introducing the hand and searching for a possible twin calf, or a ruptured uterus. On one occasion, having removed a second calf, I omitted this procedure, and a third one appeared on the scene some time later. As a rule the question of the presence of a calf is quickly settled, but there are one or two conditions in which it is necessary to be very cautious in giving an opinion.

A cow with twin calves and the complication of hydrops amnii, or a large pot-bellied animal, may easily get one into difficulties, especially if the arm is short. On one occasion, having delivered a cow which had passed many gallons of "waters," I again introduced the arm up to the shoulder (my arm is quite a long one), and made a sweeping movement with the hand around the uterus, the latter forming a very large cavity, and at the same time informing the owner the purport of my search. I felt nothing, and was very surprised on returning the following day to find that another dead calf had been taken away. Of course, in this case the calf, a small one, was downward and forward, and quite beyond reach at the moment.

Many years ago I saw a cow with hydrops amnii, and was sent for a day or two later to see her again, as labor pains had begun. The stall was flooded, and on exploring I could just

touch the fetus with the tips of my fingers, so decided to wait a few hours (the patient seeming comfortable) for the calf to come the better within reach. Returning to the case in the evening, I was horrified to find the cow tympanitic, and bigger than before the escape of the waters. Gas-forming organisms had done their work, and the fetus ballooned.

When in doubt in these cases it is best, before giving a definite opinion, to examine the cow down, or otherwise raise the floor of the abdomen and then re-examine. It is sometimes necessary to be very cautious when testing for pregnancy by means of a rectal examination. Some time ago I examined in this way a fat cow over 200 days pregnant. Her stomachs were rather loaded at the time. Nothing suggestive of the fetus could be felt **per rectum**, and the examination was carefully carried out. It is easy to give a positive opinion when the fetus can be felt, but to form a negative one, because you are unable to palpate it, is not always wise.—F. T. Harvey in The Veterinary Record.

ROPY MILK

One of the most noticeable and troublesome as well as the most frequently occurring abnormal fermentation of milk is known as "slimy" or "ropy" milk. A condition sometimes develops in which the milk on standing several hours will adhere to any object with which it comes in contact and in well developed cases can be drawn out into threads several inches long. Such milk also fails to mix readily with water when poured into it.

Milk which behaves in much the same manner as described for ropy milk may sometimes be obtained as the result of infection or physiological irregularity in one or more quarters of a cow's udder. Ropiness of such origin is noticeable at once in the fresh milk, does not increase on standing, and the trouble does not spread to other milk. It should, of course, be excluded from any milk intended for market.

The ropiness resulting from bacterial growth outside the udder is not noticeable at all until the milk has stood for several hours. It increases with the age of the milk and will be passed along to uninfected milk handled in the same vessels. It is especially troublesome in bottled milk where it is first noticeable in the cream layer.

Milk affected by this fermentation is probably no more injurious than ordinary sour milk; in fact, in some countries, milk is purposely fermented by bacteria of this class. The Bulgarian buttermilk, which has been extensively advocated in recent years as a health-giving drink, often exhibits a considerable degree of ropiness. Nevertheless, ropy milk is unusual and for this reason disgusts the average consumer.

Although in no way serious from the standpoint of human health, an outbreak of ropy milk is a serious matter to the dairyman, who invariably suffers a loss of trade and prestige; to the farmer whose milk is rejected at the marketing point; or to the manufacturer who finds himself possessed of a quantity of milk on which he is unable to carry out the usual manufacturing processes.

Such outbreaks appear suddenly and from no apparent cause and may disappear of their own accord, though they usually persist for some time unless a vigorous campaign is undertaken to suppress them. They seem especially liable to occur during warm spells in spring and fall, but may occur at other times. The trouble may be confined to a single farm or milk-handling establishment; or it may involve an entire community.

Various sources have been suggested as the origin of the bacteria causing this trouble. It has frequently been attributed to stagnant water in or about neglected watering troughs or cooling vats. But, whatever the original source, which is often uncertain, the bacteria are commonly carried along on unsterilized utensils. From a single point of infection the trouble may be spread over the entire community by means of unwashed or unsterilized cans or through by-products returned from the central marketing point.

Sterilization of Milk Containers

The remedy for an outbreak of ropy milk or other abnormal fermentation is the thorough washing and sterilization of everything that in any way comes in contact with the milk.

Sterilization of vessels may be accomplished by the use of steam. Unfortunately, steam under pressure is not available on most farms and, even if available, can not readily be applied to floors, trucks, vats, and certain machinery. The following is given as an efficient substitute treatment: Thoroughly clean the cooling vat, stock-watering vat, or other large container, and fill with clean water. For each 100 gallons of water add from ¾ pound to 1 pound of chlorinated lime, otherwise known as calcium hypochlorite or bleaching powder. Mix thoroughly. In this solution immerse for half an hour or longer all utensils in any way coming in contact with the milk. The solution may then be used to good advantage for scrubbing the milk room and surroundings.

The superiority of chlorinated lime over other common disinfectants for this purpose lies in the

fact that it is not poisonous; is not corrosive to metals in a solution of this strength; does not leave behind a persistent or disgusting odor (in fact it is a widely used deodorant); and is much cheaper than most of the other materials commonly used as disinfectants. As put up in 12-ounce cans for household use, it retails at about 15 cents. In bulk lots at the factory it is commonly quoted at 3 cents a pound or less.

Chlorinated lime owes its efficiency as a disinfectant to the fact that about 35 per cent of its weight is loosely bound chlorine, which is liberated when the material is dissolved—free chlorine being one of the most active disinfectants known. When used directly as a disinfectant, chlorinated lime has the disadvantage that it may leave a sediment of lime on the article treated. This difficulty may be overcome by dissolving the material in a comparatively small quantity of water, allowing the lime to settle and using only the clear solution. This clear solution, when fresh, is an excellent disinfectant for most purposes, but loses strength on standing.—*Monthly Bulletin*, Ohio Experiment Station.

HEALTHY CALVES FROM TUBERCULOUS PARENTS

Success in rearing healthy calves from tuberculous parents is reported in Alaska Stations Bulletin No. 5, Eradication of Tuberculosis in Cattle at the Kodiac Experiment Station, recently issued by the Department of Agriculture.

This work, which has been going on for five years, was originally undertaken in an effort to save the valuable herd of cross-bred Galloway-Holstein-Friesian cattle which had been developed at the station and which had become infected with tuberculosis from unknown sources.

Thirty calves of different breeds dropped in the tuberculous herd from 1917 to 1920, inclusive, were taken from their dams 24 hours after birth, kept in separate quarters, and fed pasteurized milk of the tuberculous cows. None of them developed tuberculosis and all were eventually added to the sound herd.

The bulletin discusses the development of the herd at the station and the subsequent advent of the disease, as well as the methods of raising the calves to prevent them from contracting and spreading the disease. A copy may be secured, as long as the supply lasts, from the United States Department of Agriculture, Washington, D. C.

DOSE OF SALICYLATE IN MASTITIS

In the May issue, Dr. J. C. Sorensen of Idaho Falls, Idaho, had an article on catarrhal mastitis of cows, in which the following treatment was given: "Sodium salicylate, four ounces; boric acid, two drams; given three times daily on a little grain, on which it is readily eaten; milking every two or three hours; bathing the teat in warm water and massaging with some ointment; or, in some cases, applying Antiphlogistine to the quarter, and the injection hypodermically of from twenty to forty c.c. milk drawn from the affected quarter, every other day," Dr. Sorensen advises that the dose given for sodium salicylate is in error. It should be "four drams" instead of "four ounces."

DEATH VALLEY FOR HOGS

There is a valley on both sides of a small stream emptying into the Missouri river where farmers have found it is practically impossible, according to their statements, to successfully raise swine. The general condition of the swine, according to the swine breeders in this area, is first noted when the pigs are small and consists of dullness, depression, and unthriftiness. The pigs root excessively and consume more or less dirt. They do not thrive, become thin and emaciated and ultimately die. As previously stated, the losses throughout this district have been so large that very few hogs are now raised in that area.

From the general description given, it is probable that the cause of the disturbance in this section is a deficiency of some essential element or elements in the diet. The pica or depraved appetite, characterized by eating dirt, is one of the outstanding symptoms of deficiency disease. The exact cause of the depraved appetite in these pigs has not been determined but it is possibly due to the fact that the grain and pasture forage in this section are wanting in some essential ingredient necessary for the development of the pigs. It is also probable that by investigation, remedial measures could be found that would render swine production in this locality profitable.

The feeders and breeders that provide proper rations for developing or fattening swine, have the fundamental principle for success in the swine industry. Veterinarians should be familiar with the feeds and food requirements of swine. The value of mineral foods has not been recognized by all of the men interested in the swine industry, and some veterinarians have not appreciated the value of minerals in

the preparation of a ration for swine. The preparation and method of feeding are individual problems on each farm and the most successful veterinarians are helping the hog producer to solve these problems.

Veterinary Medicine will be glad to have suggestions from any of its readers not only concerning the prevention and relief of disease, but also methods of feeding and discussion of essential elements in food stuffs to counteract depravity of appetite and deficiency disease.

A. T. Kinsley

"BULL-NOSE" IN PIGS*

This is a popular discussion of the subject by Dr. L. Van Es. The occurrence, source and manner of infection, symptoms, treatment and prevention of the disease are given. On the latter subject the author says:

"The key to all of this group of diseases is sanitation and this means the maintenance of surroundings which are safe for an animal to live in.

"In the prevention of those diseases, 'bull-nose' included, cleanliness is the principal factor. Knowing that the infection is contained in the manure and in soil contaminated with the same, it is quite obvious that young pigs must be kept away from unclean yards and stables.

"Before farrowing time the pens in which the pigs are to be born must be thoroughly cleaned and disinfected in the manner recommended for the prevention of worms. If the pens have only a dirt floor, this should be removed to a depth of three or four inches and fresh clean soil, taken from a field used for crop growing, hauled in to replace it.

"Before the sow is placed in the farrowing pen, she herself must be given a most thorough cleaning and scrubbing in the course of which all filth adhering to her skin must be removed. For the prevention of 'bull-nose' it is further necessary to clean the pens daily, removing all manure while an occasional disinfection by means of some of the cheaper coal-tar disinfectants increases the margin of safety considerably.

"When the time comes for the young pigs to be turned out, they must not be turned into any old hog lot. Instead they should be taken to some pasture land and there, with the sows, housed in so-called colony houses. On a well ordered swine-raising farm, the crop rotation should be so planned that a fresh pasture is available for every new pig crop so that two or more years separate each occupation by swine.

"It is further advisable to so arrange the hog lots about the farmstead that they can be rotated from year to year in order to give the soil plenty of time to rid itself of infectious materials. Water holes and wallows should be eliminated.

"In addition, the prevention of 'bull-nose' requires that the pig's teeth be not meddled with. It is not necessary to pull or cut any of them, black or otherwise. If the sharp teeth of the pigs are annoying to the sow while suckling, they may be carefully blunted by means of a fine file, but all manipulations involving the risk of causing abrasions of the soft parts should be avoided. When it is necessary to prevent rooting by 'ringing,' this operation should be postponed until well after weaning time and then it should be done under antiseptic precautions."

* Extension circular 225, University of Nebraska, Lincoln.

PARALYSIS IN SWINE

I should like to know if there is a successful treatment for a disease commonly called paralysis of hogs in the hind parts, mostly in sows that have pigs from one week to a month or so old. I have had severe cases in my practice but very poor luck in treating them.—C. E. S.

Reply: The condition you have described may be the result of tuberculosis, fractures particularly of the pelvic bones, neuritis and possibly there may be other causative factors. The most common cause of such condition in brood sows and particularly at the time or soon after farrowing, is of dietary origin. In such instances the bones are less dense, usually enlarged. This rarefied condition is usually spoken of as osteomalacia.

During pregnancy the development of the fetal bones requires calcium salts, usually in excess of the supply of those salts in the feed, and it is not uncommon for lime salts to be depleted in the pregnant animal's body. It has been demonstrated that extraordinary quantities of lime salts are eliminated from the animal body in the milk. In fact, the general rule is that more lime salts are eliminated in the milk than is consumed in the feed. The balance in this instance is obtained by depleting the milk producing animal system of lime salts. It is, therefore, evident the pregnant animals and animals during the milking period should receive food especially rich in lime.

For the cases you mention, we would suggest that calcium phosphate be provided in doses of two to three ounces daily for 200 pound sows; the dose being varied for animals of lesser or greater weight. In addition to the lime salts, it has been found that codliver oil in some way yet unexplained causes an absorption of larger quantities of lime from the ingested food than will be absorbed if such an agent is not used. Therefore, in addition to the lime salts, above described, we would suggest that you also provide three or four ounces of cod liver oil to be divided and given in about three doses daily. In most cases this line of treatment will cause a correction of the condition unless the animals are down or apparently paralyzed, due to fracture of the pelvis, which you will understand is also due to decalcification of the bone due to excessive use in the developing fetuses.

A. T. K.

PREGNANCY DISEASE OF EWES

This is one of the most insidious diseases of the flock, for it is apt to pass unnoticed until a number of ewes are found down, at which time a cure is almost impossible and can be effected only by producing abortion of the fetus in the early stage of the disease. Sheepmen should watch their flocks carefully at this time and take precautionary measures immediately they observe the first symptoms.

Symptoms

There is a tendency in affected ewes to lag behind the rest of the flock, to show a weakness of legs, a poor coordination of muscles and an inclination to stagger or walk weak-legged. Shortly after these preliminary symptoms, the sheep appears to go blind for one or two days, will sometimes walk in a circle or rest against some object. During this time it does not eat or drink and apparently has difficulty in swallowing. Later on the ewe will go down.

During this stage of the disease the sheep will grit their teeth and the limbs gradually give way; the weakness is too great, although they are not paralyzed. The ewe later often runs at the nose, (a mistaken idea attributes this to grubs in the head), breathes with difficulty, and the breathing becomes more difficult as death approaches. Finally the sheep becomes unconscious and dies shortly after, that is, seven or eight days after the first symptoms have been noticed. In some cases the ewe is ready to give birth shortly before death but has not the strength to do so.

Postmortem Lesions.

The lesions are acute degeneration of the liver and kidneys caused by a decrease in the urine that contains a larger albumin content and decreased amount of urea. The liver has an anemic or pale cooked-like appearance; the brain is congested; the lungs are meaty in appearance and congested; and the blood is very dark. These lesions are very similar in many respects to eclampsia in other species of animals.

Preventive Measures.

The fact that this disease occurs principally in the best flocks of the state and with the best breeders and feeders sems to indicate that it is not a deficiency disease, but is due to other causes. Certain practices, in some instances, have been found to prevent further trouble.

Pregnant ewes should not be fed a too high protein ration, and salt should be fed in rock form only, or mixed in feed so that no ewe will gorge herself on salt. If the disease occurs, nothing but bran and green stuff or clover or alfalfa hay should be fed, and if a ewe becomes sick a dose of ¼ pound of Epsom salts should be given at once. Then, abortion may sometimes be produced by giving an intravenous injection of from 300 to 400 c. c. of sterile normal physiological saline solution (0.85% sodium chlorid and 4% magnesium sulphate). This injection has produced abortion in a few cases, but sufficient trials have not yet proved it a certain method. Common abortive drugs have not proved efficient. When rid of the fetus the ewe recovers very rapidly and will soon be on her feet.

Nature of the Disease.

We have shown by bacteriological and other tests that this is not an infectious or a parasitic disease. A good many are of the opinion that it develops from improper feeding, but a survey of conditions under which sheep are kept and survey of flocks where it has never appeared, seem to indicate that feeding is not a factor. Attempts to associate this with forage poisoning have all been negative. Clinical symptoms, lesions or tissue changes, absence of infection and results of tests of urine, indicate this is a typical toxemia of pregnancy.

Inasmuch as the cure is so difficult and may not be effected with any great degree of certainty, the only way to prevent excessive losses is to feed properly, to use only bran and clover or alfalfa hay with green stuffs, and to keep an excess of salt away from the pregnant ewes.

Lexington, Ky. A. J. Steiner.

VASECTOMIZED RAMS AS TEASERS

In farm animals, with the exception of sheep, there is usually no difficulty in detecting females which are in heat. In South America and some other countries, however, a special kind of teaser is used with mares. This is a scrub stallion which has been operated upon in such a way as to prevent copulation—the act of breeding.

In purebred flocks of sheep several rams are often used for stud service. Unfortunately the rams can not all be pastured with the ewes if the individual pedigrees are to be kept. A common plan is to pasture the ewe flock together and to yard them at night in a pen adjoining that of the rams. The ewes which are in heat will come to the fence, are selected out by the shepherd and bred to the desired rams. In large flocks, ewes may be missed by this method. Another plan is to use for a teaser a ram wearing a cloth apron. This works better, yet accidents do sometimes happen. The third method in use is that in which the ram is controlled by a long leash while he singles out the ewes to be bred. This has obvious disadvantages. In view of the shortcomings of these various commonly-employed methods, it is our opinion that vasectomized rams can be used to excellent advantage as teasers in valuable flocks.

Vasectomy is the surgical removal of part of the vas deferens. The vas deferens is the duct which carries the spermatozoa from the testicle to the penis. The operation is performed by tying this duct in two places about half an inch apart and removing the intervening portion. This effectively dams back the seminal fluid which carries the spermatozoa, and, if the duct from each testicle is operated upon, renders the animal sterile, but does not reduce his sexual desire. The animal performs the act of copulation in exactly the same way as a normal male. In this case the fluid discharged comes only from the secondary sexual glands, and not from the testicle.

The operation has long been practiced upon laboratory animals, such as rabbits and guinea pigs. Following Steinach's rejuvenation experiments in Germany upon rats and other animals, it is said to have been favorably received by the medical profession in Germany as an operation to rejuvenate old men. So far as we are able to learn, vasectomy has never been put to a practical use in the case of farm animals. In experimental breeding work with rabbits, vasectomized males are often used as teasers, for which purpose they are highly satisfactory. Whenever the experimental work involves artificial insemination in rabbits, these teasers are practically a necessity, owing to the fact that the ova, or eggs, are not liberated from the ovaries of the doe until stimulated by the act of copulation.

Successful vasectomy does not diminish the secondary sexual characteristics, such as horn growth of rams, or the sexual desire of the subject. If any change does take place, it is rather an increase than a decrease in the sexual desire. Physicians in this country who have operated upon defective men maintain that there is no other effect, except that it renders the patient sterile. Our experience with the operation on rams, boars and male rabbits leads us to believe that the effect in them, if any, is a slightly increased sexual stimulation.

The tissue of the testicles of vasectomized animals sometimes shows degeneration of those cells which form the spermatozoa. There are other cells in the testicle, and they remain either unaffected or slightly increased. Undescended testicles, as well as testicles experimentally replaced in the abdominal cavity, are similar in microscopic appearance. In other cases the germinal epithelium of vasectomized animals remains functional and spermatozoa are formed. These are retained in the tubules, finally degenerate and are resorbed. In neither case is the formation of the internal secretion which stimulates the formation of secondary sexual characters prevented.

There are certain conditions on pure-bred stock-farms where breeders could advantageously use as teasers males operated upon in this manner, and so avoid inconvenient and sometimes embarrassing occurrences. With sterilized instruments, reasonable care and good technic on the part of a competent veterinarian, unfavorable results are rarely observed.—B. L. Warwick, D. V. M., University of Wisconsin, in The Breeder's Gazette.

HOOKWORMS IN DOGS

Hookworms are common in dogs, the records of the laboratory showing that one dog in four of those examined is infested with this parasite. It occurs alike in dogs of all ages. This worm belongs to the group of blood suckers, and in addition to the blood which it takes from the dog, the wounds it produces on the intestinal mucous membrane permit the entrance of bacteria.

Examination of the feces after they have been properly handled for microscopical examination permits of an easy and certain diagnosis. The

eggs which reach the exterior in the feces are oval bodies about one-three hundredth (1/300) of an inch long, and their appearance is such that they can easily be told from the eggs of any of the other worms which live in the intestine of the dog. Since fecal examination is the only certain method for detecting the presence of this parasite, it should always be made.

The presence of hookworms being thus ascertained, treatment should be instituted. This presents no difficulty. Fast the dog for twelve (12) to twenty-four (24) hours, and then administer:

Carbon tetrachlorid, 0.3 c.c. per kilogram or about two and one-half (2½) minims per pound of the body weight. This should be given in a hard capsule, and care taken to see that the capsule is not broken in the mouth. Purgatives are not necessary.

Most of the worms will come away the first day, but they may continue to pass for four days.

The only precaution to observe is to make sure that the carbon tetrachlorid is chemically pure. Unfortunate results may follow from the use of an impure drug.—Howard Crawley, Parasitologist, Pennsylvania Dept, of Agr., Circular No. 2.

RABIES IN DOG

A Police dog about two years of age was brought in for autopsy and diagnosis.

The dog was the property of a prominent physician, and it had been noticed for three or four days that he acted in an unusual manner, being restless and nervous. The owner had confined the dog for observation. Attendants reported that the dog was cross and irritable, but had a good appetite until the morning of May 2nd. At noon of May 2nd an attendant administered a rather large dose of magnesium sulphate, making use of a dose syringe to get it down as the dog did not swallow readily. The patient showed signs of respiratory distress and died in about four hours.

On autopsy the stomach and intestines were found to be empty, showing that in spite of the history the dog had not eaten for a considerable time. No other abnormalities were found in the alimentary tract, except the buccal membranes were extremely cyanotic. The respiratory membranes were also cyanotic. The lungs were found to be exceedingly edematous, being practically full of a watery or serous fluid.

Microscopic examination of brain sections revealed the presence of Negri bodies in the motor cells.

Undoubtedly this dog was in the early stages of rabies, and when the magnesium sulphate was given it passed into the lungs, producing a severe edema which drowned the dog in a few hours. In many cases it is not possible to detect Negri bodies in the early stages of the disease, and had this been such a case, and the history less complete, it would not have been possible to determine the nature of the primary disturbance.

Ashe Lockhart

Kansas City, Mo.

RUPTURE OF THE DIAPHRAGM IN A DOG

On October 29th, a four-year-old springer spaniel was run into by a passing motor car. The car did not go over him, but knocked him out of the road with the near fore wheel. I saw the dog shortly after his accident, and there did not appear to be anything seriously wrong with him, except that he micturated at frequent intervals.

On November 11th, an urgent request was sent me to go and see the spaniel, as he was very distressed, and breathing with great difficulty. When I saw him I found that his respirations were extremely rapid, and that the breathing was of an abdominal variety. At each expiration the sleek area between the last rib and the angle of the hip would be ballooned out. The temperature was 104° F., and the pulse 78. There was a considerable dullness over the lower portion of the chest. Loss of appetite was complete. On the third day the dog commenced to eat; the temperature became normal, but the difficult respirations continued. As no improvement was taking place, I suspected a ruptured diaphragm, and had the dog radiographed on December 6th, and the screen verified the diagnosis. A loop of the bowel could be seen on the left side of the chest, whilst there was a large dark area on the anterior side of the diaphragm. (Skiagraph exhibited.) The dog continued to be bright and fed well. With the owner's consent an exploratory laparotomy was made on December 9th. It was pointed out that when the abdomen was opened the air would rush in and the lungs would collapse. This is exactly what happened, but the respirations continued for over two minutes after the peritoneum was punctured. There was a great flow of ascitic fluid. The diaphragm was torn from top to bottom, and the torn edges had healed. In the chest was a loop of small bowel and the greater portion of the liver. The por-

tion of the liver that was in the chest was much congested and enlarged. The base of both lungs was congested. The extraordinary thing is that the dog lived such a long time after the diaphragm ruptured. It must have become slightly ruptured at the time of the accident, and the rupture extended on November 11th. The intestines and liver that were incarcerated were not adherent to the chest walls.—F. Chambers, F. R. C. V. S., in "The Veterinary Record."

SOME SKIN DISEASES IN THE DOG

Apart from mange and lice, itching is most frequently seen in dogs (and cats) at the time of change of coat, and it is then rather physiological than pathological, though owing to domestication and insufficient attention many dogs at this time become subjects of skin disease as a result of skin infection from scratching and nibbling themselves. Dirt and neglect are the direct causes of nine-tenths of the skin diseases of the dog. Retention of coat is a condition seen almost daily in practice, and it will repay veterinarians to study its treatment.

In treating erythema, I do not like either starch or bran baths, especially for long-coated dogs. It is often difficult to get the bran out of the hair. Borax or bicarbonate of soda is preferable, and carbonate of magnesia is very useful as a mild saline aperient.

Seborrhea is much more common than is supposed and is often contagious. In those Pekingese where sebaceous cysts are commonly found, this condition is followed by the formation of sebaceous warts often of a horny nature, which become so numerous as to make treatment difficult and often inadvisable. Salicylic acid has proved in my hands the most useful means of treatment in the form of solution in spirit or castor oil and used as a brilliantine. Resorcin is not to be advised, as it has the effect of turning the white coat of some dogs into a kind of olive green, and there seems to be no method of removing the stain.

Acne is sometimes followed by bacillary necrosis, a condition most difficult to treat.

Urticaria is often seen, not as a simple swelling of the head, but in the form of true nettlerash all over the body. The swellings soon disappear and require prompt treatment if the veterinarian is to have any say in the cure.

Alopecia or baldness is most frequently seen in the dry non-pustular form of follicular mange, and differential diagnosis is not easy. Attention has been drawn to the fact that in many dogs (and particularly brindle and red dogs), where the coat has been lost from some known cause, such as ringworm, sores, etc., it is often difficult to get the hair to grow again; but this is especially so if the skin is bare long enough to become pigmented. I believe pigmentation is a definite hindrance to hair growth, and there seems to be some connection between pigmentation and several pathological conditions of the skin, and particularly those affecting the growth of coat.

I do not believe that true eczema is to be found in the dog, except perhaps in cases of eczema of the scrotum, one of the most painful conditions we are called upon to treat. On the other hand, acute impetigo is common and amenable to treatment.

The so-called chronic eczema of the back (called by some psoriasis) is more frequently the result of chronic irritation from retained coat or following chronic kidney disease in old dogs.

I do not believe that there is such a condition as non-parasitic eczema of the ear flap. The condition is a dermatitis which arises as a result of fermentation of debris and secretion in the ear, the direct sequel to the presence of ear mites. Ointments are not much use and should be avoided in these conditions. The old-fashioned blackwash will be found very useful on wet surfaces. In dealing with sore ears, one should be careful not to bandage in such a way as to exclude air. It is important to keep the ear flap turned back.

Mange is perhaps the most important skin disease we have to treat and is probably the easiest also. Sulphur, properly applied, is an absolute specific. It is essential for success that one should apply the dressing oneself, and treatment must continue for three weeks, even if a cure seems to have been obtained before that time has elapsed.

It is very remarkable how often mange seems to pass undiagnosed. Either it is not recognized, or the practitioner has not the pluck to state the truth. Many dogs are not thoroughly treated and the coat is not clipped in preparation. In this way cases hang on for long periods and the dog as a result often loses its coat and becomes pigmented and bald. I have seen many dogs with dermatitis, the direct result of over-treatment, whose owners were still rubbing in sulphur ointment. Cessation of dressing and cooling baths soon restored health in apparently incurable cases.

The best remedy I have used for follicular mange is zinc chlorid in 4 to 8 per cent solu-

tion, scrubbed in every day with a brush. Collargol intra-muscular injection is also useful. I have had no success with vaccines in such cases. —Discussion by Mr. Stainton, M. R. C. V. S., Midland Counties Veterinary Meeting, Leicester, Dec. 7, 1923, reported in "The Veterinary Record."

TENALINE WITHDRAWN FROM AMERICAN MARKET

Due to insufficient sales, Tenaline for the present will not be on sale.

The outstanding feature in the sale of Tenaline has been repeat orders from all those who have used it. This speaks for the efficacy of the preparation.

If those who have used it think it will be a loss to the veterinary profession of America in the event sales are discontinued and they care to state their candid opinion of Tenaline, I shall be pleased to so advise the manufacturers. The limited sale of any teniacide will neither make nor break the agent handling it. If American practitioners would like to continue to be able to procure this preparation, now is the time to make it known. If not, I take the view—it is their loss and not mine.

Reginald Vickers

The Plains, Va.

WEAK LEGS IN CHICKENS

During the past few years a number of investigators have attempted to use young chicks as experimental animals in the study of nutrition problems. Some have reported favorable results while others have been unable to grow normal chicks in confinement even when feeds were used that had proved to be adequate for rats and other experimental animals. The chicks usually developed a condition known as "weak legs" which is characterized primarily by improper bone development and the failure to develop secondary sexual characteristics.

Experiments which we are now conducting show this condition to be identical with rickets in mammals. The lesions are the same and the conditions under which it is produced are the same as those which cause rickets.

These experiments show that young chicks receiving a standard scratch feed and mash supplemented with sprouted oats and fresh buttermilk will develop rickets (weak legs) if they are kept in a room where the light is filtered through glass, while chickens receiving the same treatment but exposed to direct sunlight a few hours each day will develop normally. Ultra-violet light was found to have the same beneficial effect as sunlight. It was also found that cod liver oil, which has been shown to contain a substance which will prevent rickets in mammals, would prevent this condition in chickens.—J. S. Hughes, Kansas State Agricultural College (Science, 2/29/24).

BLINDNESS IN FOWLS APPARENTLY DUE TO IRITIS

A condition has been noted in fowls during the past year in which blindness has been the outstanding symptom. Search through the available literature has failed to throw any light on this condition.

Inquiries in regard to blindness and specimens showing the condition have been received from several counties in Missouri, adjoining states and from Virginia. A total of twenty-eight specimens showing iritis have been examined to date.

History: The history of the cases is usually meager. Out of a flock of several hundred, two or three birds will be noted from time to time segregated from the remainder of the flock and unable to locate familiar objects. More than two to four per cent of the flock is seldom affected at the same time. Occasionally quite heavy losses are reported. The condition has been seen in White and Brown Leghorns, White Wyandottes, Anconas, Rhode Island Reds, White Rocks and Hamburgs.

Symptoms: The affected birds are usually in good flesh and often in laying condition when symptoms first appear. One first notices that the bird will walk or fly against buildings, fences or other familiar objects. When walking, careful, hesitating strides and a jerky pecking motion of the head are characteristic. On examination of the eyes, the conjunctiva, cornea and eyelids are found to be normal. The eyeball may appear bulged and feel tense on palpation. (Intra-ocular tension.)

The iris is practically always discolored. The normal orange colored pigment may at times persist around the periphery of the iris; at other times it is scattered as small flakes, but more often it is absent entirely, and the iris has a dull steel gray appearance. A bluish membrane is formed at the pupillary margin to the size of a pinhead. The edge of the membrane is irregular in outline. In the beginning stages the pupil reacts sluggishly to light and mydriatics, but as the condition becomes aggravated no reaction is obtained.

Gross Pathology: On dissection of the af-

fected eye the aqueous humor, and the vitreous body are usually found to be clear. The lens is sometimes slightly clouded. The capsule of the lens is firmly adherent to the posterior surface of the iris (posterior synechiae). No characteristic gross systemic lesions have been noted in affected birds. In several cases some chronic condition such as parasites or ulcers of the gizzard, connective tissue mites or inspissated yolk material have been encountered. Other autopsies have yielded negative findings.

Cause: As far as is known the cause of this type of blindness is as yet undetermined. At this station attempts have been made to transmit the condition to healthy fowls by six trials, all of which resulted negative. Intra-ocular, intravenous, subcutaneous and oral administration of the contents of eyes and other tissues from affected birds were employed in attempting transmission. Co-habitation has also failed to transmit the condition to healthy birds.

Iritis in the human family is attributed by DeSchwenitz to constitutional disorders, infections, toxins and traumatism, and is classed by him as a secondary rather than a primary condition. On this basis chronic constitutional conditions occasionally encountered would explain certain cases of iritis in fowls. However, as occult lesions are not constant, continued search must be made for other possible causes. Hereditary tendencies are factors of possible importance.

Course and Treatment: Under ordinary flock conditions blind birds soon die of emaciation. When birds are kept in small pens where food and water are accessible, they may live and appear otherwise healthy for a long period of time. When chronic conditions, such as those which impair digestion are present, the affected bird goes down in flesh rapidly and dies.

No treatment has as yet been found which would either prevent or alleviate this type of blindness.—Year Book, Missouri State Poultry Association.

NICOTINE SULPHATE FOR LICE IN POULTRY

Repeated trials indicate that nicotine sulphate (Black Leaf 40) is a very effective agent in destroying and eradicating lice on poultry. It may be used in the form of a powder or as an ointment with equal effect. In the form of a powder, one part nicotine sulphate to 90 parts powdered chalk, or completely air slacked lime, may be dusted into the feathers either by means of a sifter top container, or by the pinch method. The ingredients must be thoroughly mixed and sifted.

In the form of an ointment, one part nicotine sulphate, 50 parts vaseline, and 49 parts of tallow and lard in proportion to be best handled at the prevailing temperature, may be applied to the parts of the body frequented by lice. The chief advantage of nicotine sulphate over other lice killers is its very moderate cost. Tobacco dust is of no value as a lice killer.—Missouri State Poultry Association Year Book.

NUTRITIONAL DISEASE RESEMBLING ROUP IN POULTRY

A disease very similar to roup in manifestation, which may affect a large percentage of a flock at one time, may be due to nutritional factors. The symptoms of this disease are weakness; emaciation; a discharge from one or both nostrils which may be followed by a swelling of the face beneath the eyes; a lischarge from the eyes which may glue the eyelids together and be followed by the formation of an adherent white film over the third eyelid and a mass of white cheesy material within the eyelids; the formation of yellowish white, round, cheesy pustule-like patches in the mouth and throat of about the size of a pinhead; and occasionally by the formation of masses of white cheesy material in the cleft or elsewhere in the mouth. This disease may be distinguished from chicken-pox by the absence of yellow color in the cheesy material and by the small size of the patches and color of the cheesy material in the mouth. It may be distinguished from "colds" and roup by the lesions in the eye and mouth, in addition to nasal discharge and swelling of the face.

Postmortem examination of dead birds usually shows the kidneys to be very pale and marked with a network of very fine white lines. Occasionally there is also found a deposit of a white material on the surface of the liver, on the membrane around the heart, or elsewhere on the surface of the organs.

It has been very definitely determined that this disease may result from insufficient supply of greens. It may occur even though the birds may be fed green food if the amount is insufficient. It has also been found in flocks which had access to growing greens, but which were at a distance from the poultry house. In these cases some of the fowls were getting a sufficient supply of greens but most of them were not going far enough away from the house to get it.

The condition can usually be readily con-

trolled by giving the birds all the green food they will eat. There may be other factors involved in producing this disease and it is, therefore, also advisable to dilute the mash by adding wheat bran.—J. R. Beach.

CHICKEN POX AND AVIAN DIPHTHERIA

Chicken pox is an infectious disease characterized by reddish grey nodules, crust-like deposits or ulcer-like sores on the unfeathered parts of the fowl's anatomy. Lesions on the feathered skin are extremely rare.

Etiology: A filtrable virus has been shown to be the cause of chicken pox. The virus is contained within the crusts and nodules and is quite resistant to thermic or chemical changes.

Natural infection: The exact mode of transmission to healthy birds still lacks satisfactory explanation. It is generally agreed that contaminated food, drinking water and litter form the medium of infection. Not infrequently the cohabitation of healthy birds with artificially infected ones fails to communicate the disease to the former, while healthy flocks kept isolated become infected spontaneously. It seems quite possible that biting or blood-sucking insects play a part in the transmission of chicken pox.

Symptoms: In certain outbreaks of chicken pox the only symptoms noticed are the presence of small crusts or nodules on the comb and wattles. These crusts become dry and drop off leaving white scaly areas which soon heal. The general appearance of the bird remains unchanged and the appetite remains good. In other outbreaks the nodules become confluent and large ugly scabs are formed. The bird becomes feverish, droopy, inappetent and finally emaciated. The mucosa of the eyes, mouth, pharynx and trachea may become affected, and emit a characteristic necrotic odor.

Prognosis: In the mild forms of chicken pox there may be a slight decrease in egg production but there is usually a low mortality. In the severe outbreaks egg production ceases entirely and the mortality is very high.

Diagnosis: The characteristic circumscribed yellow nodules or dry, gray crusts of chicken pox are diagnostic. In individual cases injury, or crusts of dry blood on the comb are occasionally mistaken for pox by the laymen. Favus is characterized by white mold-like deposits and should not be confused with pox.

Avian diphtheria (canker), when it occurs simultaneously with external pox lesions, is undoubtedly due to a similar causative agent. However, a great many cases of avian diphtheria have come to our attention in which the virus could not be demonstrated. There are, in all probability, several etiological factors responsible for the formation of pseudo membranes in the oral mucosa.

Treatment: For individual treatment tincture of iodin continues to be the drug par excellence for local application. This may be followed by the inunction of any mild medicated ointment. There are as many forms of treatment as there are individuals but none have proven their superiority or specificity.

When the eyes are affected the accumulated material must be removed and the parts washed with a mild antiseptic. Following this, argyrol in 2 per cent solution may be dropped in the conjunctival sac. The pseudo membranes which form in the mouth and trachea must be removed and the parts may be painted with tincture of iodin and glycerine aa, silver nitrate or argyrol.

Prevention and flock treatment: The sanitary conditions of the house and surroundings play an important part in the control of chicken pox as in all infectious diseases. The removal of the infective material and the spraying of the house with an odoriferous disinfectant make the premises less habitable for the virus as well as possible insect carriers. Mild purgatives and intestinal antiseptics are often beneficial in that they keep the flock in a more resistant condition. Mild antiseptics in the drinking water, such as potassium permanganate, one quarter teaspoonful to a gallon, mercuric chlorid, 8 to 10 grains to the gallon, or sulpho-carbolate tablets, may be of some value in checking the spread of the disease and will appease the owner and possibly prevent him from becoming a victim of the many patent roup cure frauds.—Dept. of Pathology, Missouri Experiment Station.

INFECTION MANAGEMENT IN POULTRY DISEASES

In the face of the more virulent poultry diseases, among which the one known as fowl-cholera is the more prevalent type, the following measures can be unqualifiedly recommended:

Remove all the members of the flock yet in apparent good health to clean, unexposed ground and quarters and there divide them in as many small separate groups as possible.

Kill all sick birds without spilling any blood on the ground and destroy all carcasses by burning. Disinfect all eating and drinking utensils and poultry houses in a most thorough manner. Leave the infected yards or quarters unpopulated by poultry until they have been ex-

posed for at least two months to the purifying influences of warm weather. During this period all pools and puddles should be drained and filled in.

Before restocking with a full flock procure a dozen young, healthy fowls, place them on the premises involved and proceed no further until they have survived in good health for a month or thereabouts.

Remember that in outbreaks of very virulent disease or in the case of extremely rapid spread of the same, it often pays to kill also the birds still healthy in order to save their meat for immediate consumption or by canning it for future use.—L. Van Es.

VETERINARY FEES

I received a hurry call to see an overheated horse and as my car was in the shop, I called a taxi, answered the call, saved the horse, returned and paid the driver. That night after thinking over the event, I figured my expense on the case, medicine, ice and taxi fee, and found that by giving my services free gratis, I came out only 15 cents in the hole.

A man who owns a truck charges from $10.00 to $15.00 to make a trip from Olathe to the stockyards at Kansas City, 17 miles. Usually these men are not college educated. A boy goes to school—8 grades, 4 high and 4 years to a veterinary college, making a total of 16 years in school. If he was six years old when he started to school, he must be 22 years old when he begins his career as a practicing veterinarian. It cost his parents at the rate of $1.00 a day to feed and clothe the boy—no money for shows or spending money either—$6,580 until he passes from high school, 4 years in veterinary college, $3,500, or $10,080 when he graduates. Then a Ford car $365.00, equipment $200.00, instruments $200.00, drugs and biologics $200.00, or a total of $11,045 that the young man has actually invested in him at the age of 22.

Now, the same old question, shall a veterinarian receive less, the same or more than a taxi or truck driver? If a veterinarian should drive 17 miles and charge $15.00 for his call and charge for the medicine he uses, some pessimist would be ready to say, "Outrageous! Down with veterinary prices!"

Other professions are not held up before the public in such a ridiculous manner. Then why the veterinary profession? Who profits by it? Does any one profit? Is it done for petty political purposes? We believe not. Is it to eliminate the veterinarian? We hope not. We don't think so. But we surely believe the veterinary profession should be thought of in the same high respect as all other professions, and in most instances it is so regarded.

Veterinarians should receive a fair remuneration for their services, time and the amount of scientific knowledge required should always be considered. Drugs, serums and biologics should be charged up to the patron. The fee should always be in proportion to the ability of the veterinarian and the quality of scientific services he renders.

I do not believe in fixing fees or considering the proposition of anyone fixing fees for veterinary services. Veterinary services are indispensable in every community. The veterinarian has on his list hundreds of patrons, ninety-nine of every hundred of whom are well satisfied both with the service and fees. But now and then, some one person, usually one who is not a regular patron, makes capital out of what he thinks an overcharge. Some think the veterinarian does not receive enough for his services. Ninety-nine out of every hundred patrons are staunch friends of their veterinarian, and they are truly believers in his ability and indispensability to the livestock industry.—Excerpt from talk at the Kansas Association meeting by Dr. S. L. Stewart, Olathe, Kansas.

THE USE OF CHLORIN FOR STERILIZING MILK BOTTLES

The Minnesota State Board of Health in 1917, passed rules and regulations outlining the requirements which pasteurization plants must meet in order to label, sell, or advertise their product as "pasteurized milk." One of the requirements provides that facilities must be available for the effective sterilization of the milk bottles. The routine investigations undertaken by the division of sanitation at pasteurization plants include field observations and bacteriological examinations to determine whether the equipment and methods of pasteurization comply with the regulations of the board. During each routine investigation several empty bottles are collected just prior to the time they are to be refilled with milk, and an examination is made to determine their bacterial content.

A study of the results obtained on the sterilization of bottles with apparatus using steam as compared with chlorin solutions, indicates that chlorin is more dependable as applied in routine practice at the plants investigated. This

is especially evident at the smaller pasteurization plants where manually operated apparatus is used. Chlorin solutions for sterilizing milk bottles have been in use for some time in a number of plants in Minnesota, and no cases have been reported of objections having been made to odors or flavors being imparted to the milk, or of any misuse of the chemical. The preparation of the chlorin solution is simple, and the chemical is inexpensive.—U. S. Public Health Reports.

HISTORY OF THE ART OF FARRIERY

It is generally believed that Xenophon, who lived three or four hundred years before Christ, wrote a small treatise on the figure and management of the horse. Celsus, the elegant imitator of Hippocrates, also wrote on the disease of animals; but the earliest authentic writings on the subject are found in "De Re Rustica," a work of the celebrated Columella, who lived in the second century, under the reign of the Roman emperor Tiberius. A compilation from the Greek writers on this subject also appeared from the pen of Vegetius, who flourished in the fourth century.

After this, a blank of more than a thousand years occurs in the history of farriery. During the dark ages, this useful art, like most others, retrograded; but it was during this gloomy period, that the art of shoeing horses with iron appears to have been invented; "an art which seems to have contributed not a little to throw the management of this noble animal into the hands of a set of arrant blockheads, who were now first called farriers."

After the sixteenth century, the veterinary art began to assume something of a scientific form; and many able writers began to appear both in France and Germany, amongst whom the illustrious Camper deserves particular notice. In England, the Duke of Newcastle, Blundeville, Markham, Barett, Snape, and Gibson, contributed to throw some light upon this useful art. The improvements of the latter were ably extended by Dr. Bracken. Next to this admired writer we may place Bartlett, Osmer, and Clark, farrier to his majesty in Scotland. The elegant work of Stubbs and Lord Pembroke also deserves mention. Amongst modern writers, the most eminent are Blaine, White, Feron, Lawrence, Boardman, and Freeman.

But the most important measure for the promotion of the art of farriery was adopted by an agricultural society at Ockham in Hampshire, which, at the suggestion of M. St. Bel, a French gentleman, opened a school in London, to which they gave the name of The Veterinary College of London. This institution was opened in the year 1790; and M. St. Bel was appointed the first professor.

The subscribers of the veterinary college pay two guineas per annum, or twenty guineas for life. Each subscriber is entitled to send, when sick or lame, any number of horses to the veterinary stables, where no charges are made for medicine, attendance, or operation: the subscriber merely pays for the keeping and shoeing of his horse. Horses of non-subscribers may be sent to the college for the professor's opinion; but they are not admitted into the stables.

Pupils, on their admission, pay a fee of twenty guineas. The professor delivers lectures on the veterinary art; and the most eminent medical teachers in London, with great liberality, allow the students at the veterinary college to attend their lectures on anatomy, physiology, surgery, chemistry, etc., gratis. There are four general examinations in the year. The period requisite for obtaining a knowledge of the veterinary art is regulated by the talents and industry of the students. Most of the cavalry regiments have been supplied with a veterinary surgeon from the college.—Excerpts from *"The Modern Farrier"* by A. Lawson, published 1841.

DEFENSIVE REACTIONS

One of the drawbacks of symptomatic treatment is the risk we run of tampering with reactions which have for object the defence of the organism. Take diarrhoea, for instance. In most cases this is protective; it is nature's way of getting rid of peccant matter from the alimentary canal. To seek to bottle it up by means of astringent drugs is to court disaster. As a matter of fact, an aperient is usually indicated far more than an astringent. Then, too, with arterio-sclerosis, in most instances a high blood-pressure is a reaction of defence. Without it the circulation could not be carried on. Fortunately our efforts to control blood-pressure usually fall short of the mark unless our measures are aimed at the underlying cause of the heightened tension. The blood-pressure, after all, is only one manifestation of a complex syndrome. We meet with patients who live a comfortable existence with a pressure of 250 to 300 mm., while others die with a pressure not exceeding 190 mm., so that there are other factors to be considered when we are confronted with this circulatory disturbance. These remarks apply **mutatis mutandis** to fever. We

are aware that the optimum temperature for most micro-organisms that infest human beings is that which is normal for man, consequently a rise of several degrees tends to hamper their proliferation. It follows that it is not only unnecessary, but is distinctly inadvisable to administer antipyretics merely for the purpose of reducing the temperature except, of course, in cases where life is threatened by a high temperature **per se**. If we can attack the cause of the fever as do quinine in malaria and the salicylates in rheumatism well and good, but the popular practice of giving a dose of aspirin just to lower the fever is irrational and has nothing to recommend it.—Medical Press and Circular, March 5th, 1924.

THE FIELD OF THE A. V. M. A. IN 1902

The Journal wishes it could agree with its esteemed contemporary the Review on this all-important question. But the facts as they exist today cannot be ignored. The holding of surgical clinics finds its best place, its best work, in the field of local and state associations. It cannot be done under national auspices half so well, nor is it within their province when time is so limited to consider so many larger problems of general interest to our whole country. It is true that we should not ignore the general or routine practitioner, but if he is only interested in seeing some surgical clinics or hearing an every-day article on spavin, cunean tenotomy, or ovariotomy, we are at a loss to know what is added to truly National Association strength by his presence. If surgical clinics draw into the national organization a large number of local practitioners in every city where we hold our conventions, and whose faces are not seen again at our conventions for the next five years, or we again return to the city near his location, we cannot conceive how our association is to grow in national importance or power. If a cheap initiation fee and small dues are attracting a large membership numerically, who look upon it as a good investment, sub rosa an office-wall certificate, an annual report that serves as a year-book, and replaces entirely a subscription to one or more veterinary periodicals, then it will be well to keep on the present plan until every veterinarian in the land may have the opportunity by our presence in his vicinity to get in and avoid the rush.

Neither are we ready for sectional work in our association, for all efforts along this line so far have proven dismal failures, and lessened materially our progress and importance. Sectional work will come when we have gathered in a large majority of the foremost men in all the various lines of our work, and not until then. It will be time enough for this when we reach the point that men no longer decline membership or to give up so much valuable time attending A. V. M. A. conventions that devote half their time in the consideration of subjects that all well-posted older graduates should know, and of which all graduates of recent years eligible to association membership are thoroughly versed in. It is time that broader association work along truly national lines should attract the attention of a greater number of those who direct National and State work to our sessions, and not find them attending National live-stock Associations, Breeders' organizations, State and National sanitary conventions, and National and State boards of health conventions to consider subjects that should first be presented and dwelt upon in the sessions of the A. V. M. A., and from there go to these other organizations as the refined judgment of the profession as a whole. No, we are not satisfied with the proposition to continue to travel along this rut any longer, nor to let this so-called well enough alone.—Journal of Comparative Medicine and Veterinary Archives, May, 1902.

THE VALUE OF RESEARCH IN ANIMAL DISEASES

How does the research worker propose to be of use to the agriculturist? In several ways. One is by finding some means of making healthy animals immune to diseases. On finding the precise causal agent of a disease and cultivating it in artificial media, he may prepare a preventive or curative serum from healthy horses, by making them so highly immune from repeated inoculations that a small quantity of their blood-serum will confer immunity upon all animals by injecting it, or he may find a suitable means of combining the serum and vaccine injections, so that a safe means of giving lasting protection against the disease can be utilized.

By finding a reliable diagnostic agent he may show how latent cases of disease can be detected, and so prevent them from acting as sources of infection for healthy animals.

By finding out the precise method of spread of the disease and showing how infection can be avoided.

By finding out the life cycle of a parasite and devising methods of interrupting the comple-

tion of the life cycle, or of destroying the parasite at a particularly vulnerable stage. Where parasites must have an intermediate host, the latter may be destroyed and infection prevented.

Even where the filtrable viruses are involved and no germ can be cultivated, one can use the body fluids in some cases very successfully as a means of giving immunity to healthy animals.

The whole object of research is knowledge. Without knowledge of diseases we cannot control them or eradicate them. In most cases every disease has to have its own peculiarities studied. Diseases may be grouped roughly according to their causal agents, but beyond this we must take each disease by itself and study every characteristic of it.—Prof. S. H. Gaiger, Glasgow, in "The Veterinary Record."

BOTULINUS TOXIN ABSORBED FROM WOUNDS

In a recent outbreak of botulism due to home-canned asparagus, the housewife placed some of the liquor of the asparagus on her tongue, and immediately washed it off because of the burning sensation. She developed symptoms of botulism within thirty-six hours, and died in four days. In a second recent outbreak of botulism due to home-canned corn, the housewife merely crushed two or three grains of corn between her teeth, but did not swallow any of the material. She developed symptoms of botulism within forty-eight hours, and died in eight days.

These cases, according to Geiger, are the only reliable records of death from botulism from apparently rapid absorption rather than from the ingestion of the toxic food. Geiger therefore performed an interesting experiment which these cases suggested. An area one inch square on the abdomen of guinea pigs was shaved, and was left red and bleeding in places; on a similar shaved area on other animals three linear incisions were made just through the skin; on other animals, on a shaved area a small skin pocket was made in the center, and on others the hair was simply plucked out. Sterile cotton swabs thoroughly moistened with toxic asparagus and corn were then rubbed vigorously over these injured skin areas. A similar swab was applied also in the vagina of other animals, and on the uninjured and normal skin of others. Every animal thus treated died with typical symptoms of botulism, except those whose skin was uninjured and normal, and those which had received antitoxin.

It seems, as Geiger says, that the absorption of botulinus toxin may occur from any mucous surface, broken skin or fresh wounds, and that it is not limited to any particular part of the intestinal tract. Extreme care should always be taken, therefore, in handling packs of food suspected of being contaminated, even though the possibility of absorption from wounds may seem remote.—Journal of the American Medical Association.

WHAT ARE FOODS FOR ANIMALS?

In order that an animal may continue to live even without making growth or producing wool, eggs, milk or work, etc., there are certain food materials which it must have. The animal must have a certain amount of protein, fat, carbohydrates, water and mineral constituents. In addition other things known as "vitamins," "growth promoting substances," or "food accessories," the chemical nature of which we know very little, are necessary. The latter substances, however, are usually present in sufficient quantities in our regular feeding-stuffs if we feed a sufficient variety and particularly if we feed a good leguminous roughage. Our feeding-stuffs usually contain mineral matter sufficient for the needs of an animal with a few exceptions, such as calcium carbonate, which we furnish as oyster shells for hens, and phosphorus and calcium which are sometimes fed to dairy cattle and pigs in the form of bone meal. If alfalfa or clover is fed as a roughage they will aid very much in furnishing a proper mineral supply. The protein, fat and carbohydrates are the foods which we are particularly interested in when we buy commercial feeding-stuffs and it is their content which largely determines the value of the feed.—University of New Hampshire Bulletin 209.

MEATS HIGH IN VITAMINS

Meat has been generously endowed with vitamins. All meats contain one or more of the varieties and some have all three in very considerable quantities. Very few foods are both rich in vitamins and at the same time composed of highly nutritious proteins. But many meats have this double advantage,—especially such meats as liver, heart, and kidney. Brains, and beef and mutton fats are rich in vitamin A and sweetbreads in vitamin B.

Professor A. E. Taylor of the Food Research Institute of Stanford University, in an address on "Food Selection Versus Food Compounding," delivered before the American Medical Association in San Francisco in June, 1923,

pointed out that the American people are neglecting "a cheap, competent foodstuff" by not using such meats as hearts, livers, and kidneys more extensively.—Swift & Co. Year Book, 1924.

HORSES AND FARM POWER

The United States department of agriculture has recently investigated the relative advantages of horse power and motor power for farm operations and reports numerous reasons for the continued use of good draft horses. Horse power is characterized by its versatility and adaptability to perform various farm operations. The horse is not limited either by the topography of the ground or a specialized ability to perform only a few farm tasks economically.

The horse is self-replacing, earns its keep, and increases in value up to the marketable age. Mares enough may be bred yearly to replace the mature stock which is marketed. The young horses raised under this plan continually increase in value and at the same time they are paying their way by doing the farm work.

Keeping horses also helps to conserve the fertility of the soil and provides an element of interest which helps to keep the youngsters on the farm. Then too, there is less direct cash outlay for horse power, as horses consume home-grown feed chiefly.

Motor power, however, has advantages under certain conditions, and in many cases the two forms of power—horses and tractors—are both used.

HORSE FEEDING MAXIMS

1. Water before feeding or not until at least one hour afterwards.
2. Feed in small quantities and often.
3. Never feed grain to heated animals.
4. Put at least a double handful of chaff in every grain feed.
5. If expecting hard work immediately after feeding, give only a half-feed.
6. When practicable have the oats crushed.
7. Shake out the hay and save the shakings for feed.
8. Use haynets.
9. When practicable give a small feed of hay before each grain feed.
10. Never feed a large hay feed immediately before grain.
11. Give a bran mash or cooked grain feed at least once a week, preferably before a day of rest.
12. Salt the horses. If cakes are supplied, always have one in each container or feed box. If granulated, feed the ration in the chop and cooked feeds.
13. Never feed hay on the ground if it can be avoided.
14. When feeding in feed bags, remove them as each animal finishes.
15. Keep feeding utensils clean.
16. Feed clean food.
17. Watch the horses feeding and know which are the slow and the shy feeders.
18. Watch their condition and fix the ration for each horse according to his needs.
19. Graze whenever the opportunity occurs.
20. Encourage men to bring handfuls of grass or other food to their horses.
21. Be economical in feeding, waste nothing; let the horse get the full value of his ration just as you want it of yours.

C. E. Jewel,
Lieut. Col., V. C. (Retired).

Alfalfa has been shown to be much superior to red clover hay for fattening steers at the Wisconsin experiment station.

It is estimated that the average output of manure for a 1000-pound cow during the year amounts to 2.8 tons of urine and 9.88 tons of dung, or a total of 12.68 tons a year, containing 79.22 pounds of potash, 125.21 pounds of nitrogen, and 24.30 pounds of phosphorus. If market values of plant foods are taken at 20 cents a pound for nitrogen, 5 cents for phosphorus, and 4 cents for potash, a year's output to the cow would have a value of $29.43, or $2.28 a ton.—Univ. of Cal. Bulletin 372.

McLEAN COUNTY (ILLINOIS) MEETING

A regular meeting of the McLean County Veterinary Medical Association was held June 4th at Bloomington, Ill. The sessions were well attended in spite of heavy rain and bad roads.

Ethical advertising by practitioners was the subject presented by Dr. L. N. Morin in his usual able style and evoked spirited discussion. It is the opinion of the veterinarians of central Illinois that the profession should be letting the public know what it has done, what it is doing and what it can do in the future for the protection of the livestock industry and the safety of public health.

Dr. M. G. Smith, who recently located at Bellflower, Ill., after several years with the

B. A. I., described the conditions confronting the profession in South Carolina, where he was stationed for a time.

Dr. L. O. Brown, in charge of area testing work in Piatt County, and Dr. E. B. Van Cleave, in charge of similar work in Peoria County, told of their experiences and the progress of tuberculosis eradication in their respective sections. A general discussion followed.

Owing to the Illinois state association meeting being held July 9th and 10th, and the A. V. M. A. meeting during August, our association will not hold other regular meetings until September. However, we will have a big summer picnic at Miller Park, Bloomington, July 30th. All who attend will bring their baskets and have lunch together at noon and in the evening. The Bloomers will be playing at home on that date, and the ball fans can be assured of seeing a good game. Dancing in the evening. All veterinarians and their families are invited.

J. S. Koen, Sec.

The Army Veterinary Service in Connection with Animals

By Capt. Geo. H. Koon

(Continued from June issue)

Animals Shipped or Issued

In order to properly protect the health, animals when moved from one station to another should be free from diseases of a communicable nature, or contact therewith, and subjected to the most favorable conditions en route. As a measure of practical economy, animals issued to any organization for duty therewith should be serviceably sound. The station veterinarian will give a physical examination and apply the required mallein and other tests to all animals intended for shipment, issue, or turn in, at such time prior to the movement as will ensure compliance with the foregoing requirements. Taking into consideration the results of the examination and tests, any obtainable information regarding exposure to communicable disease and any other pertinent facts, he will recommend to the commanding officer the temporary or permanent elimination from the lot of any animals whose movement to another station would be dangerous to the health of themselves or of others; the elimination of any animals not serviceably sound; and the further disposition of all animals thus eliminated. He will see that animals to be shipped, issued, or turned in, are placed in the best possible physical condition, having special reference to the teeth, shoulders, skin, feet, and shoeing, and will advise against movements of those in which such defects have not been corrected. He will take timely steps to relieve minor or curable physical disabilities and will recommend that animals unserviceably sound be submitted to an inspector.

An animal should not be removed from a station while in absolute quarantine. An animal should not be removed from a station while in working quarantine unless necessity demands, in which event care should be exercised that the quarantine is not broken en route to the new station.

Stock cars provided for the shipment of animals will be examined by the station veterinarian for suitability, state of repair, and cleanliness before the sanding is placed therein and subsequently, before loading. The veterinary officer will also examine into the nature and extent of the cleaning and disinfecting methods and will supervise any further disinfection which may be required. He will likewise observe such conditions as defective floors, projecting nails, ventilation, protection from the elements, and other matters in connection with the condition of the cars which may tend to produce animal losses or disability. He should bring defects of every kind to the attention of the commanding officer with appropriate recommendations for their correction, and in case they are not corrected, he should advise the rejection of the cars. He should advise as to the routing of the shipment with reference to the facilities available for feed and rest.

In all cases of shipment, issue or turn in, the station veterinarian will prepare the prescribed health certificate on Form 101, M. D., in accordance with instructions in Army Regulations, with a view to furnishing to the veterinarian of the receiving station any information of value.

The station veterinarian will recommend the detail of veterinary personnel to accompany the shipment when he deems it advisable and will see that such personnel is fully instructed in the required duties. A veterinary officer or, in the absence of an officer, an enlisted man of the veterinary service designated to accompany a

shipment of animals, or any section thereof, will, upon arrival at destination, submit to the Surgeon General through military channels, a detailed report of the journey. This report will show number and kind of animals; time required to load; suitability state of repair and cleanliness of the cars provided; date and hour of departure, of arrival at and departure from each feeding station, and of arrival at destination; description of feeding and watering facilities and other conditions encountered en route; sanitation, adequacy, and suitability of yards provided; kind, quality and adequacy of forage supplied; reasons for, and duration of, delays en route; names of all attendants; complete data regarding any sickness or deaths amongst the animals; and their condition on arrival. Special note will be made regarding the length of time which the animals are required to travel without unloading for food and rest and, when such intervals are excessively prolonged, all particulars pertaining thereto will be stated in full. Should sick animals be left en route, the diagnosis and the name of the individual with whom left will be stated. Special note will be made of known or suspected exposure to communicable disease.

The importance of avoiding the transmission of communicable diseases to civilian-owned animals must be considered whenever the sale of surplus or condemned public animals is contemplated. The station veterinarian will examine all such animals at such time prior to sale as will enable him to certify to their freedom from serious communicable disease or probable contact therewith. He will also utilize all veterinary facilities at the station to place the animals in the best possible physical condition. The minimum requirements for a veterinary health certificate under such conditions will include freedom from clinical signs of glanders or other serious communicable disease at time of sale, a negative intradermic mallein test within the 21 days preceding the date of sale, and freedom from contact subsequent to the test, with animals yielding positive or suspicious reactions to a glanders test, or with clinical signs of glanders. Veterinary health certificates will be executed on Form 101, M. D., conformably to Army Regulations.

In order that the instructions hereinabove may be complied with, the station veterinarian will be given timely notice by the commanding officer when the issue, shipment, sale, receipt, or turn in of one or more animals is expected to occur, and the destination or source of the same.

On the death or contemplated destruction of a public animal, whether it is on sick report or not, the station veterinarian will be promptly notified. Prompt report will be made to the accountable officer, accompanied by a certificate signed by the responsible veterinary officer, setting forth fully the cause of death and stating whether it resulted from the fault or neglect of any person. The same procedure will be followed when an animal is destroyed on account of communicable or incurable disease or injury after first securing the approval of the commanding officer for destroying the animal except when the animal has been inspected and condemned and its destruction directed.

All cases of accidental death or of disease or injury warranting destruction will be carefully investigated by the station veterinarian before giving an opinion as to the cause or recommending destruction. An autopsy will be made when necessary to clear up any doubt which may exist as to the correct diagnosis or for any other purpose. Immediate destruction is required whenever an animal is found to be infected with glanders, anthrax, or surra. In the case of many other conditions the question of the advisability of attempting a cure must be determined after mature consideration of the various factors involved, such as the prognosis in like cases, the possibility of transmitting the disease to other animals, the probable length of time necessary to effect a cure, and the degree of serviceability which may be expected in the event that the condition itself is cured. The destruction of animals will be accomplished in a humane manner, preferably by shooting.

The station veterinarian will make suitable recommendations to the commanding officer as to the best method of disposing of animal carcasses and will supervise the operation of the plan adopted. Carcasses and parts thereof may be conserved with profit to the government through the operation of salvage plants. If infected with anthrax, glanders, or rabies, their handling becomes a menace to other animals and to men, and the carcasses will not be conserved but will be burned or buried by the military authorities with all possible expedition.

This completes the veterinary service in connection with animals. While the presentation of the subject may have appeared lengthy, in reality it is but a brief sketch, touching only the high spots from the purchase of animals until their final disposition.

The veterinary meat and dairy hygiene service will next be discussed.